



Doctoral School of Education
Faculty of Education and Psychology
Eötvös Loránd University
Budapest, Hungary

MUNI

Department of Educational Sciences
Faculty of Arts
Masaryk University
Brno, Czech Republic

DOCTORAL (PhD) DISSERTATION

Deisi Yunga

Educating the reflective professional in teacher education: professional learning in teaching and in other professions.

Budapest, 2019



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-curie grant agreement No. 676452.

EÖTVÖS LORÁND UNIVERSITY

FACULTY OF EDUCATION AND PSYCHOLOGY

Doctoral dissertation in education

DOI: 10.15476/ELTE.2018.234

Educating the reflective professional in teacher education: professional learning in teaching and in other professions

Deisi Yunga

Doctoral School of Education

Head of the Doctoral School: Gábor Halász, DSc habil.

European Doctorate in Teacher Education (EDiTE)

Leader of the programme: Gábor Halász, DSc habil.

Supervisors

Kereszty Orsolya, PhD habil and Kovács Zsuzsa PhD adjunktus. , Eötvös Loránd University
Petr Novotný, Ph.D., Masaryk University

Members of the review board:

Chairperson: Gábor Halász, DSc habil.

Secretary: Erika Kopp, Ph.D. habil.

Opponents: Benkei-Kovács Balázs Ph.D. adjunktus
Petr Hlad'o, Ph.D

Members: Mandel Kinga, PhD habil.
Nóra Rapos, PhD habil.

ACKNOWLEDGMENTS

To my life cheerleaders, my parents Rosa and Isidro to whom I owe the person I am today. To my brother Byron for showing me sincere love and encouragement during my academic life and to my brother Isidro for being a constant presence in my life.

To my sisters Alexandra and Karina and my nieces Valeria and Romina who are the bright light in my life.

To all the members of my extended family who are too many to name but have supported me along the way.

A very special gratitude goes out to all the members of the EDiTE program in Austria, Czech Republic, Poland, Portugal and Hungary for all the moments we shared in these three years. My sincere gratitude goes to Prof. Gábor Halász who has been a source of endless support during these three years of study. Also, I want to thank Prof. Milan Pol, leader of the EDiTE Program in the Czech Republic. Thanks to Prof. Kari Smith, and Prof. Kathy Schultz who have helped me personally and professionally.

Many thanks to my supervisors Prof. Orsolya Kereszty, Prof. Zsuzsa Kovács and, Prof. Petr Novotný who have helped me to walk this path. My eternal appreciation to the members of the technical secretariat of the EDiTE program: Tímea Szöllősi, Luca Pap, Judit Saád, Kinga Káplár-Kodácsy, Zuzana Šmideková, Ondras Barta and Ula Kłobuszewska who have been a strong support not just for me but for my fellow ESRs.

I am deeply thankful to all my teachers in the faculty of Education at Eötvös Loránd University and Masaryk University and my peers Csilla Pesti, Helena Kovács, Kinley Seden, Dev Raj Paneru, Vasilis Symeonidis, Wiktor Bernad, Andras Fehervari, Wanderson Aleksander Oliveira, and Nikolett Szelei, I feel truly blessed for having the opportunity to work and learn from you. To the members of the Kairat Team: Taisia Muzafarova and Gulsaule Kairat for being the best of friends. To my partner Josh Boström who has been a strong support during this time.

Finally, I want to thank to one of the best teachers I ever had, Prof. Betty Salazar Calderón who believed in me and gave me a lot of the confidence I needed to walk this path.

ABSTRACT

The aim of this dissertation is to promote a better understanding of the way professionals learn while performing their daily work activities and what practices can be extracted from such realm in order to be implemented in the teaching profession.

This dissertation takes up “critical realism” as an underlying philosophy and sees professional learning as an unintended result of the interaction between three complex systems namely the organization, the community and the individual. The division into these three levels was necessary in order to find a reasonable way of “comparing” professions bearing different goals and nature. Data gathering involved semi-structured interviews subsequently coded with N-Vivo and Quirkos software.

This study followed the work of 25 professionals allocated in five different fields: a) Architecture, b) Information Technology, c) Human Resources, d) Educational Researchers, e) Vocational Education and Training (VET) Teachers. All the participants in this study were working in Austria, Czech Republic and Hungary despite coming from different nations such as Brazil, Bhutan, Czech Republic, Hungary, The Netherlands, Serbia, Slovakia, Peru, Poland. The peculiarity of this sample was purposely organized since nowadays there is an undeniable demographic change in the labor market picturing high levels of mobility not just within the European Union but also outside of it. The research process mostly looked into the day-to-day professional challenges VET teachers experience in their workplace taking up transferable solutions mediated from other professions.

The results identified various practices that could be extrapolated to the VET teaching profession in several ways. For example, the importance of cooperation among professionals of different areas identified in the profession of Architecture, the openness to new knowledge as seen in the HR area, communal problem solving as detected in the IT profession and the mediating role of managers between the employee and the working knowledge in the educational research field. Therefore, it becomes quite evident that the teaching profession needs to look farther beyond its usual collaborators and try to look for solutions to challenges stemming from different fields in a trans-professional fashion.

Finally, this study leaves the door open for a deeper conversation on the effectiveness of teachers’ adoption of practices from other professional areas.

ABSZTRAKT

Ennek a disszertációnak a célja, hogy segítsen jobban megérteni, hogyan tanulnak a szakemberek napi munkájuk során és hogy ezeket a gyakorlatokat hogyan lehet megvalósítani a tanári szakmán belül. A disszertáció filozófiai alapja az ú.n. “kritikai realizmus”, és a szakemberek tanulási folyamatát három komplex rendszer (a szervezet, a közösség és az egyén) egymás közötti interakciójának előre nem tervezett eredményeként tekinti. A három szint bevezetése azért volt szükséges, mert csak így volt lehetséges “összehasonlítani” a különböző célú és természetű szakmákat. Az adatgyűjtés félig struktúrált interjúk alapján történt, amik utólag N-Vivo és Quirkos szoftverrel lettek kódolva. A tanulmány 25 szakember munkáját követte, akik öt különböző területen munkálkodnak: a) építészet, b) számítástechnika, c) humán erőforrás, d) oktatáskutatók, e) szakképzésben tanítók. A tanulmány minden résztvevője Ausztriában, Csehországban és Magyarországon dolgozik, annak ellenére, hogy eredetileg más országokból érkeztek, mint például Brazília, Bután, Csehország, Magyarország, Hollandia, Szerbia, Szlovákia, Peru és Lengyelország. Ez a sokféleség szándékolt, hiszen tagadhatatlan, hogy jelentős demográfiai változások történtek a munkapiacra a nagyfokú mobilitás következtében, ami nem csak Európán belül, hanem azon kívül is jellemző.

A kutatási folyamat elsősorban a szakképzésben tanító szakemberek napi szintű kihívásait vizsgálta, akik más szakmák megvalósítható gyakorlatait igyekeznek átvenni.

Az eredmények számos, a szakképzésben sokféleképpen felhasználható gyakorlatot mutattak. Például az építészetre jellemző, a különböző szakterületek összefogását célzó kooperáció fontossága, a humán erőforrás területén tapasztalható nyitottság az új tudásra, a számítástechnikában jelenlévő közösségi problémamegoldás, vagy a menedzserek tudást közvetítő szerepe az alkalmazottak felé az oktatáskutatás terén.

Nyilvánvaló tehát, hogy az oktatásnak mint szakmának nyitnia kell a megszokottól eltérő utak felé is, és meg kell próbálnia saját területének kihívásaira más szakmákból megoldásokat találni.

Végezetül elmondható, hogy a tanulmány nyitva hagyja további, elmélyült viták lehetőségét arról, hogy mennyire hatékonyak a tanárok más szakmákból átvett gyakorlatai.

ABSTRAKT

Cílem této disertační práce je podpořit lepší porozumění tomu, jak se profesionálové učí během provádění každodenních pracovních aktivit a jaké postupy můžeme z tohoto světa získat, abychom je zapojili do učitelské profese.

Tato disertační práce si bere „kritický realismus“ coby základní filozofii a dívá se na profesionální učení jako na mimovolný výsledek interakce mezi třemi komplexními systémy, jmenovitě organizací, komunitou a jednotlivcem. Rozdělení na tyto tři úrovně bylo nezbytné za účelem nalezení rozumného způsobu „porovnání“ profesí různé povahy a s různými cíli. Sběr dat zahrnoval částečně strukturované rozhovory, následně kódované softwarem N-Vivo a Quirkos.

Tato studie sledovala práci 25 profesionálů z pěti různých oborů: a) Architektura, b) Informační technologie, c) Lidské zdroje, d) Průzkum vzdělání, d) Učitelé na středních odborných učilištích (SOU). Všichni účastníci této studie pracovali v Rakousku, České Republice a Maďarsku, ačkoli pocházeli z různých zemí jako je Brazílie, Bhútán, Česká Republika, Maďarsko, Holandsko, Srbsko, Slovensko, Peru, Polsko. Různorodost tohoto vzorku byla záměrně organizována, protože v dnešní době dochází k nepopíratelným demografickým změnám na pracovních trzích, kde vidíme vyšší mobilitu nejen v rámci Evropské Unie, ale i mimo ni. Proces výzkumu se převážně zabýval každodenními výzvami, kterým čelí učitelé středních odborných učilišť ve svém pracovním prostředí, a případnými řešeními, která lze přenést z jiných profesí.

Výsledky identifikovaly různé postupy, které je možné extrapolovat do profese učitele SOU několika způsoby. Například, důležitost práce mezi profesionály z různých oblastí, kterou se podařilo najít v profesích z architektury, otevřenost novým znalostem, kterou vidíme v oblasti HR, společné řešení problému, typické pro IT profese a mediační roli manažerů mezi zaměstnancem, a pracovní znalosti na poli výzkumníků vzdělání. Proto se poměrně evidentní že učitelská profese se potřebuje dívat dále než k obvyklým spolupracovníkům a snažit se hledat řešení výzev, které mají kořeny v různých oblastech meziprofesionálním způsobem. Konečně, tato studie nechává otevřené dveře hlubšímu zamyšlení nad efektivitou přijímání postupů z jiných profesních oblastí učiteli.

TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	3
ABSTRACT	4
TABLE OF CONTENTS	7
LIST OF FIGURES.....	10
LIST OF TABLES	11
LIST OF ACRONYMS.....	12
CHAPTER 1. Introduction	13
1.1 The EDiTE Project	13
1.2 Theoretical Background of the Dissertation.....	16
1.3 Problem Statement.....	17
1.4 Purpose of the Study.....	18
1.5 Research Question	18
1.6 Conceptual Framework.....	18
1.7 Definition of Terms	20
1.8 Assumptions.....	21
1.9 Nature of the Study.....	22
1.10 Scope and Delimitations	22
1.11 Significance of the Study	23
1.12 Timeline and risks analysis	23
CHAPTER 2 – Literature Review.....	25
2.1 Adult Learning theories	25
2.1.1 Professional Learning Theories and Research.....	25
2.2 Factors related to professional learning	30
2.2.1 Goal rationalities or learning frameworks of professional learning within the workplace	30
2.2.2 Review of Empirical research on Professional Learning	31
2.3 Factors related to Professional learning	33
2.3.1 The importance of professional learning.....	35
2.3.2 Types of Professional learning	36
2.4 Factors linked to professional learning.....	40

2.4.1 Framework of Professional learning.....	41
2.4.2 Contextual Factors affecting Informal Learning.....	43
2.4.3 Organization	44
2.4.4 Human Environment	49
2.4.5 Collective Learning.....	49
2.4.6 Individual Professional Learning	52
2.5 From Professional Learning to Professional Development.....	58
2.5.1 Need for professional learning practices	58
2.5.2 The importance of professional learning practices	60
2.6 Complexity Theory.....	62
2.6.1 Core elements of complexity theory	63
2.6.2 Complex systems versus complicated systems.....	64
2.6.3 Complexity Theory and its role in Education & Professional Learning	65
2.6.4 Summary and limitations of Complexity Theory	69
CHAPTER 3 – Methodology.....	71
3.1 General Research Design & Rationale	71
3.1.1 Research Philosophy.....	73
3.1.2 Research approach	77
3.2 Research plan	79
3.2.1 Research context.....	79
3.2.2 Research questions.....	80
3.2.3 Participant Sampling Criteria & Recruitment.....	82
3.3 Pilot Study.....	84
3.4 Nature of Data & Collection Methods For Thesis.....	87
3.4.1 Primary data as semi-structured interviews.....	87
3.4.2 Data collection protocol.	87
3.4.3 Tools.	88
3.5 Data Analysis Plan	88
3.5.1 General Procedure for Content Analysis.....	88
3.5.2 Steps in Analysis.....	89
CHAPTER 4 – Results.....	93
CHAPTER 5 – Discussion and Conclusion.....	106

5. 1. Regarding findings implications.....	106
5.2. Limitations of the study	109
5.2.1. Limitations Pertaining to Sample Size	109
5.2.2. Limitations Pertaining to Data Collection.....	110
5.2.3. Limitations Pertaining to Recruitment Methodology.....	111
5.3. Recommendations.....	112
References	114
APPENDICES	124
Appendix 1. Analysis of learning perceptions among professionals. Example: HR sector.....	124
Appendix 2 . Interview consent form	131
Appendix 3. Interview guideline.....	132
Declaration form for disclosure of a doctoral thesis	134

LIST OF FIGURES

Figure 1. EDiTE programme support system - ESR 15	14
Figure 2. Dissertation planning and PEST analysis	24
Figure 3. Diagram of layers analyzed in this study	33
Figure 4. Elements that may affect professional learning based on literature review	41
Figure 5. Relationship between organizational culture and organizational learning.....	46
Figure 6. Organization politics map	48
Figure 7. Research “onion” illustrating this dissertation	71
Figure 8. Data collection plan	79
Figure 9. Architects learning dynamics regarding leadership involvement.....	96
Figure 10. Educational researchers learning dynamics regarding leadership involvement..	97
Figure 11. HR officers learning dynamics regarding leadership involvement.....	98
Figure 12. IT professionals learning dynamics regarding leadership involvement.....	99
Figure 13. Workplace features supporting professional learning	101
Figure 14. Impact of the Community on Individual Learning	102
Figure 15. Impact of individual learning on community of practice.....	104

LIST OF TABLES

Table 1. Professional learning processes.....	42
Table 2. Process-power relation dynamics.....	48
Table 3. Pedagogical and andragogical assumption about learners.....	57
Table 4. Critical realism.....	74
Table 5. Demographic information of the sample.....	84
Table 6. Example of initial coding framework.....	90
Table 7. Example of final coding framework after reduction of categories in the initial coding framework.....	91

LIST OF ACRONYMS

CEDEFOP - European Centre for the Development of Vocational Training

EDiTE – European Doctorate in Teacher Education

ELTE – Eötvös Loránd University

ESR – Early Stage Researcher

EU – European Union

HR – Human Resources

ITN – Innovative Training Networks

ICT – Internet and Communication Technologies

IT – Information Technologies

MSCA – Marie Skłodowska-Curie Actions

MU – Masaryk University

OECD – Organisation for Economic Co-operation and Development

SWOT – Strengths, weaknesses, opportunities and threats

PEST – Political, Economic, Social, Technological

PD – Professional Development

SAM - Strategic Assessment Model

UNESCO - United Nations Educational, Scientific and Cultural Organization

VET – Vocational Education and Training

WP – Workplace

WPL – Workplace Learning

CHAPTER 1. Introduction

1.1 The EDiTE Project

The European Union (EU) through the Horizon 2020 has supported the training of over 100 000 researchers in the last 20 years through the Marie Skłodowska-Curie Actions (MSCA) (European Commission, 2017). The MSCA is an important tool of EU educational policy by supporting new generations of Early Stage Researchers (ESRs). The mainstream PhD training carried out by the MSC is run by the Innovative Training Networks (ITNs). An ITN is a consortium of academic partners or industries that come together for a four-year period offering PhD education research and training programs to ESRs on a specific topic (Doonan, Taylor, Branduardi, & Morrissey, 2018)

This dissertation is part of the European Doctorate in Teacher Education (EDiTE) funded by the European Union *Horizon 2020* and formed through the strategic alliance of five universities: a) University of Innsbruck (Austria), University of Lisbon (Portugal), Masarik University (Czech Republic), University of Lower Silesia (Poland) and Eötvös Loránd University (Hungary)

The EDiTE program has three main pillars in which it is based: a) *Transformative Teacher Learning*, b) *Better Student Learning within* and, c) *Emerging European Context* (Rasiński, Tóth, & Wagner, 2017)

The international character of MSCA played a crucial part in the conception and development of the research design and executions within the project. The mandatory secondment provided the opportunity to the ESRs for experiencing another academic culture and gathering data for their dissertations.

Within this framework, Eötvös Loránd University developed the sub-topic named *Learning Teacher* which includes the dissertations of ESR13, ESR14 and ESR15. These three projects are meant to be complementary to one another and to provide a holistic view of the *Learning Teacher* in Europe.

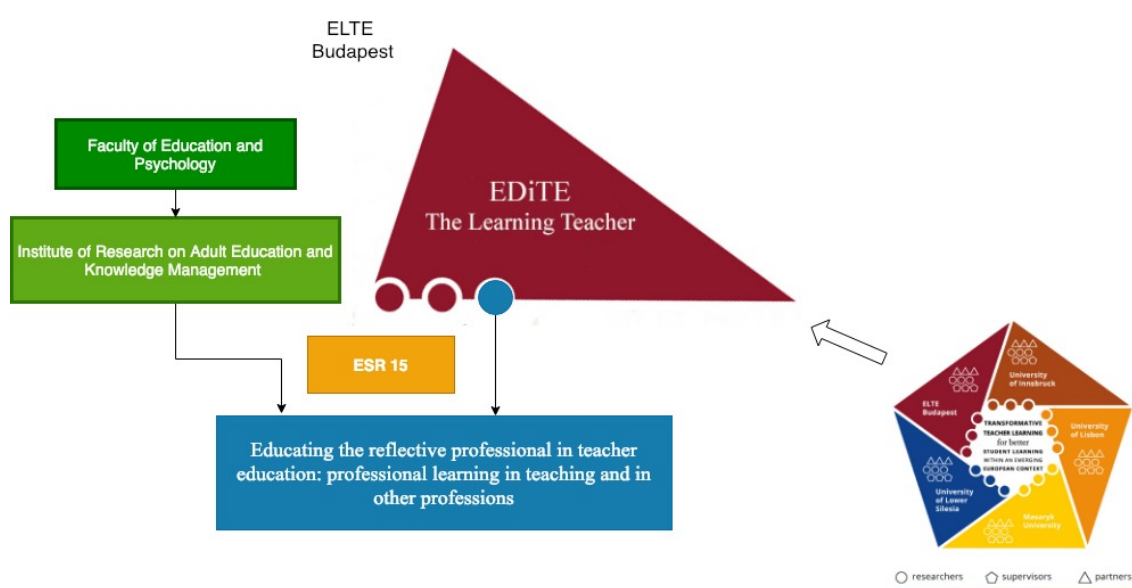
ESR 13 dissertation focuses on initial teacher education

ESR 14 dissertation focuses on teachers' learning in non-conventional environments

ESR 15 dissertation focuses on professional learning in teaching and other professions.

This dissertation corresponds to the work of ESR 15 with the topic *Educating the reflective professional in teacher education: professional learning in teaching and in other professions* which, as shown in figure 1, it was coordinated at the institutional level by ELTE's Faculty of Education and Psychology through the *Institute of Research on Adult Education and Knowledge Management*. At the internal level, this thesis was developed with the aid and input of members of the extended ESR group and academics participating in the project.

Figure 1. EDiTE programme support system - ESR 15



Source: EDiTE material

Background of the Research Topic

In order to present the origin and interests of this dissertation, it becomes important to describe the personal, professional and environmental circumstances that support the need for researching trans-professional learning possibilities from this ESR's point of view as the researcher in charge of this dissertation. First of all, trans-professional learning in this study must be understood as the practice of extrapolating good practices, strategies, tools, etc. from one field to another. Trans-professional learning is different from the current understanding of interprofessional learning being the latter understood in terms of mutual cooperation as

well as the learning that takes place among fields that are meant to work together (e.g. doctors, nurses, therapists, etc.) However, the trans-professional learning approach intends to look at unusual careers and examine solutions that extrapolate its own professional field serving as alternative solutions to other professions.

Secondly, I know first-hand that practices from one area can be successfully implemented in other areas, as was studied in my bachelor's degree, in the area of law. Being a lawyer, I could have never foreseen that I would pursue a career in education. However, after obtaining my degree in Law and working as an assistant lecturer in my university, I realized that my true calling was in the education sector, and I pursue an Erasmus Mundus Master's Programme in Teachers Training which allowed me to start my academic career and now leading to a doctoral degree in Education. At first sight, my topic might sound quite unique, but that is hardly true, in fact, according to a report from the Foundation for Young Australians (2015), young people are expected to have 17 jobs over five different careers in their professional lifetimes, of course, there are careers that will probably demand specialization such as medicine but the vast majority of young people will experience the challenges of working in different professions while performing a wide variety of activities. In my case, I have already been a lawyer, a national leader, a teacher and a researcher and I have had at least ten different jobs in which I have been able to transfer all the abilities and skills acquired in these jobs.

Multiple times I have used the *Socratic method* learnt in law school to explain a case during my teaching practice, also the leadership abilities acquired as a national president of an NGO greatly served me during the development of my thesis, and as such I have several examples in which unlikely sources of information and experience, came together to help me face the challenges in my professional life, for instance, I'm confident that trans-professional learning is some sort of a hidden secret disguised in plain sight and I am fortunate enough to have been given the opportunity to work in a project that shares this perspective. If people are carrying experiences from one career to another, it is not so different of extracting good practices from one professional field to another and in this dissertation, I intend to explore this possibility.

1.2 Theoretical Background of the Dissertation

Over the past twenty years, only a few studies have examined professional learning across different careers (Cheetham & Chivers, 2001; Daley, 2001; Safdar, 2012; Shulman, 2006). These studies have examined the core pillars of academic education by researching signature pedagogies in different professions (Shulman, 2006). Others have worked on inventories and similar quantitative tools to track different components of professional learning (Cheetham & Chivers, 2001; Daley, 1999). Several researchers have focused on the knowledge acquired from particular areas within specific professions and have examined their application in different occupational fields (Daley, 2001). In addition, other researchers have identified principles already extracted from different professions and applied these principles within specific professions (Safdar, 2012). However, it is not known whether, or to what extent, professional learning elements from other professions can be applied to the teaching of a profession as there are no studies examining this phenomenon. Professional learning must be considered in relation to the contextual factors and complexities of each profession to be studied such as the social, legislative and economic climate within each field, meaning workplace dynamics and the characteristics of the organization, product industry and individual factors, such as personality and motivational characteristics.

Professional learning itself has conventionally been treated as an individual and person-centered process, related to personal experience as well as the acquisition of disciplinary and problem-solving competencies (Fenwick, 2012, p. 4). The problem with these person-centered views is that the complexity of the world around the professional is either avoided or bypassed missing out the social interactions of the individual within the professional environment. To expand this individualistic ‘acquisitional’ metaphor, it becomes important to adopt an interactionist, sociocultural perspective that incorporates the individual and the role of the environment, rules, tools and social relations that surround the professional.

This dissertation considers the complexity of the workplace, its components, social interactions, and the context in order to assess the factors that support professional learning.

1.3 Problem Statement

Previous research on professional learning has adopted a perspective that focuses on either the role of the individual and the community or the organization. However, previous research has scarcely focused on the combination of these factors in relation to professional learning. At this point, it is important to adopt an interactionist approach that accounts for individual differences and social relationships within the environment, community or organization. For example, organizational science has shown that the atmosphere within the workplace is important because of the presence of workplace politics and power dynamics that can lead to the highest levels of motivation or to dysfunctions. Within the area of Education, organizational learning characteristics and leadership behaviors can also influence employee learning and development. Consequently, in developing a framework for understanding professional learning, it is important to consider how the individual is shaped by both intrinsic factors, such as self-determination and self-efficacy, and those extrinsic factors that lie outside the person such as organizational climate and leadership style that influence workplace policies and practices. It is not often seen in the professional learning research that macro, meso and micro factors have been considered as a part of a complex system.

It is important to adopt a broad perspective in examining the phenomenon of professional learning for being it such a complex issue. Although the micro-context (individual characteristics of teachers or programs) is relevant, it is important to include meso-level and macro-level factors as well. Ignoring meso (institutional) and macro (school system) contexts underplays the complexity of professional learning (Opfer & Pedder, 2011, p. 378). Consequently, a theoretical model that encompasses, micro, meso and macro factors is important for understanding professional learning, not just in the teaching profession but in other professions as well.

The objective of this thesis is two-fold. First, the thesis will apply theory and practice from other professions and extrapolate the findings to the teaching profession. Second, the thesis will draw on organizational science and view the professional learning phenomenon under the lenses of complexity theory. Complexity theory is useful since it understands professional learning as a complex system with multiple interacting parts that cannot be

separated from one another which would otherwise key aspects of how the system works and what makes it work (Cochran-Smith et al., 2014, p. 111)

1.4 Purpose of the Study

The purpose of this study is to identify challenges in the teaching profession and to extract solution alternatives from other professions in a trans-professional manner.

1.5 Research Question

This study has one main research question that will draw from the social sciences and professional learning theory and will be examined through field data analysis.

1. What perceived innovations exist in the different professions that could be applied to the teaching profession?
 - 1.1 What challenges exist on the Vocational Education and Training (VET) teaching daily practice?
 - 1.2 What kind of solutions exist in other professions to answer to these challenges?
 - 1.3 How can such processes become adequate in order to be adapted as innovations to the teaching profession?

This study contributes to the research literature because it is one of the first studies to focus on professional learning using the complexity theory framework.

1.6 Conceptual Framework

This thesis will draw on complexity theory to explore phenomena within the field of professional learning. One of the more recent innovations that has taken place within the social sciences is the development of the use of complexity theory to understand how the environment impacts human cognition and behavior (Holland, 2015). Originally used in the so called “hard” sciences, complexity theory has been used specially in interdisciplinary,

transdisciplinary and multidisciplinary studies (Davis & Sumara, 2014). There are multiple definitions of complexity but, in short, one can say that complexity is the opposite of simplicity (Gerrits & Verweij, 2015) and stability. A complex adaptive system is defined as a “diversity of agents who interact with one another, mutually affect one another, and in so doing generate novel behavior for the system as whole” (Marion & Uhl-Bien, 2001). Complexity theory has been applied in organizational settings to comprehend how effective organizations gain a competitive advantage through leadership strategy and direction (Marion & Uhl-Bien, 2001).

The present dissertation locates itself in the realm of professional learning and identifies its interacting parts as a complex system. The thesis draws on complexity theory in acknowledging that an understanding of the single constituent parts of professional learning does not automatically convey into a perfect understanding of the whole system's behavior and outcomes. Complexity theory rejects linear causality and takes under consideration the whole system instead of just a part of it (Davis & Sumara, 2014).

One of the advantages of complexity theory is that it offers a new perspective of how organizations can enable professional learning within a complex adaptive system (CAS). Within a CAS, relationships are not hierarchical but focus on the social interactions among individuals and across social networks (Marion & Uhl-Bien, 2001). A CAS is comprised of individuals and groups who ‘bond’ through shared knowledge, skills, and interests. This bonding occurs through shared experiences and similar perspectives on the environment (Lichtenstein, Uhl-Bien, Marion, Seers, Orton & Schreiber, 2006). Complexity theory has been applied within high functioning organizations to understand the innovation process (Lichtenstein et al., 2006) so it is useful for understanding how educational establishments trigger radical innovations in professional learning. The interactions within a complex environment such as an educational setting can be tense because individuals respond to both external and internal pressures as individuals struggle with interdependency and conflicting restraints (Lichtenstein et al., 2006). However, these tensions can be productive in leading to system-wide innovations (Lichtenstein et al., 2006) when they are spread across the organization’s network. It is argued that these triggers in innovations are due to the

interactions among individuals rather than being due to the specific acts of leaders (Lichtenstein et al., 2006). Complexity theory has been applied to understanding changes in curriculum development and to trigger a shift from teacher-centered learning to student-centered learning (Ng, 2014). Complexity theory has been previously used as a framework to study teachers professional learning. (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014; Wilson, 2015) In those studies, the authors have associated the high complexity of teachers learning as well as professional and organizational learning in general with complexity theory to avoid simplistic and reductionist standpoints. Consequently, it seems appropriate to apply complexity theory to understanding professional learning and radical changes within programs that foster professional learning.

Although complexity theory is a useful framework for understanding professional learning, it is important to note that critics of complexity theory challenge its inability to produce causal explanations with implications for practice; moreover, complexity-informed research cannot manage the power inequalities inherent to the political structure of education (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014, p.5) In order to produce explanations for the professional learning phenomena, this dissertation claims for “critical realism” as its core philosophy in order to develop an informed causality and produce causal explanations and implications for practice from the data acquired for this study.

1.7 Definition of Terms

The terms used in this study reflect the analyzed theories and expected outcomes on the professional learning phenomenon.

Learning is a matter of transformations in the learner that are simultaneously physical and behavioral – which is to say in biological terms, *structural*. Learning is certainly conditioned by personal experiences, but it is “due to” the learner’s own complex biological-and-experiential structure, not an external stimulus. (Davis & Sumara, 2014, p.12)

Formal learning. Learning that occurs within an organized and structured context (formal education, in-company training) and is intentional from the learner’s perspective. Normally, it leads to a formal recognition (diploma, certificate). (Cedefop, 2004).

Non-formal learning. Learning embedded in planned activities that are not explicitly designated as learning, but which contain an important learning element. Non-formal learning is intentional from the learner's point of view. (Cedefop, 2004).

Informal learning. Learning resulting from daily life activities related to work, family, or leisure. It is often referred to as experiential learning and can, to a certain degree, be understood as accidental learning. It is not structured in terms of learning objectives, learning time, and/or learning support. Typically, it does not lead to certification. Informal learning may be intentional but, in most cases, it is non-intentional (or 'incidental'/random) (Tissot, 2004).

Workplace learning. Broadly speaking workplace learning can be defined as the acquisition of knowledge or skills by formal or informal means that occurs in the workplace (Cacciattolo, 2015, p. 243) There are several definitions for workplace learning and several authors have developed theoretical frameworks for the phenomenon (e.g., Graham & Chivers, 2001; Hager 2001; Cacciattolo, 2015).

Professional Learning. Professional learning is the “process of improving and increasing the capabilities of staff through access to formal, non-formal and informal learning opportunities”.

1.8 Assumptions

An assumption is a self-evident truth or probability (Simon & Goes, 2013). This study assumes that professional workplace learning is part of a meta complex system in which other components also take part as complex systems. Moreover, it is assumed that complexity theory with the addition of some features of critical realism becomes beneficial to describe and interpret circumstances, events, relations and processes associated with professional learning. Finally, this research assumes that every profession faces several “hidden” on-the-job learning circumstances, elements and strategies. Furthermore, the factors that influence workers learning experiences are also presumed to be partly unseen or hidden. This study aims to identify and analyze those circumstances, elements and strategies.

1.9 Nature of the Study

This study is qualitative in nature and uses a narrative enquiry methodology. The main method being used is semi-structured interviews and a kappa coefficient between coders was used for reliability. The professions analyzed are: Architecture (A), Human Resources (HR), Educational Researchers (EDR), Information and Technology Engineers (IT), Vocational Education and Training Teachers (VET). Each professional group consists of five interviewees. Semi-structured interviews were conducted and analyzed using the software N-Vivo.

1.10 Scope and Delimitations

This study was conducted with the participation of both European and Non-European professionals working on a European context. Although the main places where the data were collected were Hungary, Czech Republic and Slovakia, the participants are nationals from other European countries, Latin American and Eurasian countries with significant working experience within the European Union (EU). Semi-structured interviews are the main data gathering method used to establish the perspectives of the participants' learning experiences within the working environment. This thesis used a purposive critical case sampling in which respondents were selected based upon the likelihood of giving the most information about the professional learning phenomena with early, medium and expert levels of working experience.

This study is delimited to five professional groups classified by the International Standard Classification of Occupations (ISCO 8) as level 4 which involves higher education and require complex problem solving, decision-making and creativity based on theoretical and factual knowledge in a specialized field and involves extended levels of literacy and numeracy and excellent interpersonal communication skills. (ILO, 2007, p.13)

Due to the small size of the sample, the results of this research cannot be generalized however, the constituent elements of this research are likely to be valuable for future research studies.

1.11 Significance of the Study

The outcomes of this study aim to provide innovative ways of approaching teachers' professional learning from the expertise of other careers. The thesis will draw on literature from various social science disciplines contributing to the literature on professional learning. The significance of this study is described in terms of advances in theory, (b) advances in practice, (c) filling gaps in the literature.

Advances in Theory. The study aims to contribute to understanding the dynamic nature of professional learning. The study aims to uncover how workplace factors influence professional learning as well as to how the workplace characteristics are related to individual learning.

Advances in Practice. The study aims to determine the impact of the organizational structure and participation on communities of practice on individual professional learning. The findings from this study will enable communities of practice to develop best practices in encouraging and developing educators in their professional learning.

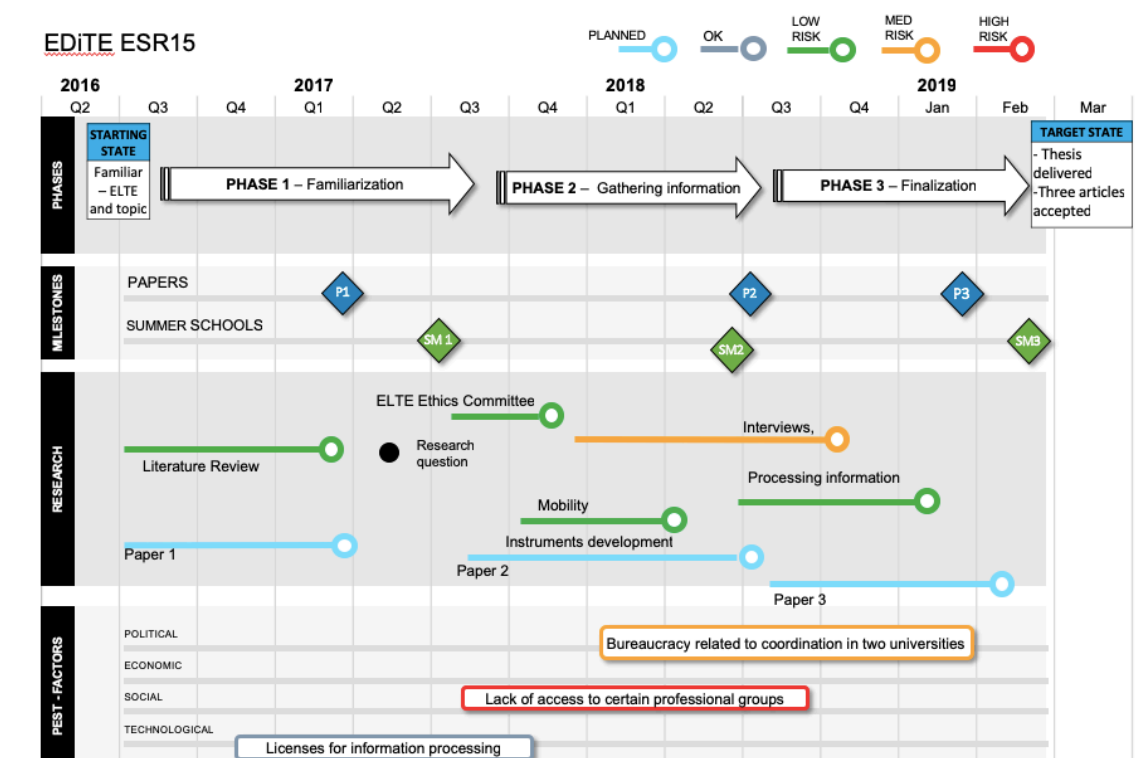
Contribution to the Literature. The study aims to fill a gap in the literature through examining the phenomenon of professional learning through the lens of complexity theory. To date, little is known about the role of organizational factors at the meso and macro level that influence professional learning. The study will contribute to the literature through focusing on professional learning in a complex environment. The study also draws on literature from social and organizational science to interpret and understand the concept of professional learning.

1.12 Timeline and risks analysis

Participating in a MSCA means to coordinate a healthy development of a proper dissertation with course work and training as part of the program, including summer schools and other events. In order to reach the successful completion of this work, a thorough planning of the steps and risk analysis was done by the researcher in order to foresee the possible obstacles

to be faced during the development of this dissertation as showed in figure 2. Following PEST analysis (Political, Economic, Social and Technological), three possible threats against the successful completion of the thesis were identified: a) bureaucracy related to coordination in two universities, b) lack of access to certain professionals or professional groups, and, c) licenses to access data analysis software. Out of these three initial concerns, just the second one proved to be a major threat to the development of this dissertation. This is further discussed in the “Limitations” section.

Figure 2. Dissertation planning and PEST analysis



Source: author

CHAPTER 2 – Literature Review

The goal of this chapter is to provide a thorough review on previous research that has examined theories and studies related to professional learning. This literature review describes adult learning theories, professional learning theories and research, factors related to professional learning and the importance for organizations to invest in professional learning initiatives.

2.1 Adult Learning theories

Adult Learning Theory suggests that adults are autonomous and self-directed and need to be actively involved in the learning process. The Adult Learners Model (Cross, 1981) suggests that adults have varying degrees of readiness and ability to learn with a need for flexibility and control over their learning. When adults are engaged in the learning process, they become active participants rather than passive recipients, and active participation can increase transfer of training (Knowles, Holton, & Swanson, 1998). There is a rich history of theories concerning adult learning. Lindeman (1926) published the following key aspects about adult learning: a) adult motivation to learn arises from experience needs that learning will satisfy; b) learning is self-centered through life situations; c) experience is the richest resource; d) adults need to be self-directing; and e) adults need individualized learning (Kelly, 2017, p. 3).

2.1.1 Professional Learning Theories and Research

Learning is a matter of transformations in the learner producing physical, behavioral and structural change. Learning occurs due to experiences and to the learner's own complex biological-and-experiential structure (Davis & Sumara, 2014, p.12) **Professional learning** is the process in which individuals engage to stimulate their thinking and **professional** knowledge and to ensure that their practice is critically informed and up-to-date. Professional learning is broader than workplace learning because it occurs both inside and outside the workplace. About professional learning Schön (1983) harshly criticised the conception of professional knowledge „the instrumental problem solving by the application of scientific theory“ “putting theory into practice“ (p. 21) and proposed a deeper epistemology based on knowing-in-action and on reflection-in-action (Pesti, 2019, p.22)

Professional learning occurs every day in formal educational contexts as well as in more informal and incidental situations. (Harris, 1999, p.161) Professional learning as part of lifelong learning is an extensive field with unclear boundaries.

During the evolution of theories of Andragogy and Adult learning, international organizations also contributed to the topic of professional learning through challenging current adult education practices. The UNESCO Institute for Education (UIE) saw “adult education as a means of developing and strengthening social and political responsibility”. The UNESCO Institute for Lifelong Learning draws its guideline principles from the Faure Report – Learning to Be (1972) and suggests innovations for core educational challenges. One of the challenges is the lack of flexibility in education, which restricts students from returning to the formal educational system after leaving at an early age. Another challenge is the lack of mechanisms to recognize learning outcomes acquired in non-formal and informal learning environments. The Faure’s Report (1972, p. 185) states:

Education should be dispensed and acquired through a multiplicity of means. The important thing is not the path an individual has followed, but what he has learned or acquired

This principle states that learning outcomes acquired in Educational Institutions, in any type of school, by part-time teaching and by out-of-school methods, whether formal or informal, institutionalized or not, will be acknowledged—on principle—as equally valid. After the presentation of the Faure’s Report (1972), many researchers supported the validity of learning outcomes acquired in non-formal and informal settings, Scribner and Cole (1973) wrote one early seminal piece pointing out that much successful learning took place outside school. Other authors defended this idea but in specific contexts. For example, Billet (2002) has argued that formal and informal learning are not distinct from each other, because even informal practices and activities through which learning takes place are partially formalized. Colley (2003) suggested that “formal, non-formal and informal” are not discrete categories, which might lead to a misunderstanding of how learning is perceived. For Colley, it is more accurate to conceive ‘formality’ and ‘informality’ as attributes present in all circumstances of learning, also important in this context is the Memorandum of Lifelong Learning (CEC,

2000) which gave a strong support to the importance of valuing learning regardless of the source. The European Commission (2009) distinguishes between three basic categories of professional learning:

Formal Learning: This learning typically takes place in an education or training institution; it is structured (in terms of learning objectives, learning time or learning support) and leads to certification. Formal learning is intentional from the learner's perspective. (Ib.22)

Non-formal learning: It is learning that is not provided by an education or training institution and typically does not lead to certification. It is however, structured (in terms of learning objectives, learning time or learning support). Non-formal learning may be provided in the workplace and through the activities of civil society organizations and groups. It can also be provided by organizations or through services that have been set up to complement formal systems, for example, arts, music and sport classes. Non-formal learning is intentionally from the learner's perspective.

Informal learning: It is learning derived from daily life activities related to work, family or leisure. It is not structure (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases, it is non-intentional (or incidental/random).

The differentiation of these concepts goes further than a mere classification. Bernstein (1971) states that formal learning leads to high-status knowledge. Because formal learning was associated with education in schools and universities, non-institutional formal learning was overlooked or dismissed.

The concept of professional learning is grounded in social science theories of behaviorism, cognitivism, and constructivism. Behaviourist learning theory bases its idea on the fact that behaviour can be researched scientifically without consideration of cognitive states. (Reimann, 2018, p.1) This theory was based on the idea of a linear "stimulus-response"

dynamic based on environmental or material re-enforcement partly discarding the mental processes involved for learning to happen.

For behaviourists, environmental conditions have a greater influence on people than the learner characteristics (Ertmer & Newby, 2013). Behaviourism describes learning as a system in which the external environment (physical stimuli) influences only certain behavioural responses. Therefore, behaviourism is concerned with the environmental origin of these responses. Skinner's work on shaping behaviour through reinforcement has greatly influenced educational practice (Cheetham & Chivers, 2001). The goal of instruction for the behaviourists is to elicit the desired response from the learner, who is presented with a target stimulus (Ertmer & Newby, 2013, p.50). Importantly, behavioural learning is the effect of reinforcement, practice, and external motivation on a network of associations and learned behaviours (Fosnot & Perry, 2005, p.8). Marsick (1987) described learning from a behaviourist perspective as observable, quantifiable, and based upon tangible performance outcomes, where training is perceived as a learning delivery system.

Cognitivism became prevalent in the latter part of the 20th century. For cognitivists, the behavioural explanations of learning largely ignored the effect of individual characteristics (Cooper, 1993). Consequently, this created a progressive shift from behaviourism to cognitivism (Lamos, 1984 as cited in Cooper, 1993). In basic terms, while behaviourist theory explains how the input of knowledge can create the output of knowledge, it ignores or omits what happens between the initial input and the output. Behaviourism does not address what can be seen before the output, such as reasoning and problem-solving (Cheetham & Chivers, 2001). From a cognitivist perspective, Hartley (1998 as cited in Cooper, 1993) defines learning as the result of inferences, expectations and making connections, placing prior learning as a crucial factor in the process of knowledge acquisition. This definition portrays learning as a phenomenon that goes beyond the mere acquisition of habits. For cognitivists, learner characteristics are more important than environmental factors. Cognitivism puts an emphasis on the acquisition of knowledge as it promotes mental processing (coding and structuring). Cognitive theories are associated with complex forms of learning, such as reasoning and problem-solving. More specifically, cognitivism involves how the mind receives, organizes, stores, and retrieves information (Ertmer & Newby, 2013).

From the cognitivist point of view, learning is concerned not so much in what learners *do* but with *what* they know and *how* they come to acquire that knowledge (Johanssen, 1991 as cited in Ertmer & Newby, 2013).

Constructivism appeared early in the literature, indeed Giambattista Vico (1725) is accredited with the first statement recognizing knowledge as constructed by the individual by saying: *The human mind can know only what the human mind has made* Von Glasersfeld (1991). However, John Dewey (1933-1998) is often mentioned as the founding father of constructivism.

Constructivism states that the interaction between the external environment and the participation of the learner is established and examined (Hyslop-Margison & Strobel, 2007). It focuses on the individual's own elaboration, interpretation, and use of information (Ertmer & Newby, 2013). Constructivism shares a common link with the social cognitive theory in the assumption that personal factors, environment, and behaviours interact in a reciprocal way (Bandura, 1986 as cited in Schunk, 2012). Also, Eraut (2000) postulated that knowledge has a distinctly social aspect and is not purely influenced by the factors of individual characteristics. The social nature of learning arises from the individual's need for knowledge from other people and is rooted in a defined set of social relations (Eraut, 2000) in this sense, a piece of knowledge may be socially rather than individually constructed (Swanwhick (2005). Piaget also described the importance of cognition within constructivist learning. His theory of personal cognition is described as self-organized and adaptive. Piaget assumes that the sense a person makes of an event is less of a function of the qualities of that event and more about the complex history of the agent's linguistically affected, biologically enabled, and culturally infused structured (Davis & Sumara, 2009, p. 65) In the Piagetianian system, each person knits an understanding from unique sets of experiences and those higher order phenomena must obey a similar complex dynamic.

Learning can't be reduced to the modification of behavior and it's not as simple as the notion that experience causes learning to happen since new theories such as complexity theory understands "experience as *triggers* and not causes" (Davis & Sumara, 2014, p.12) The co-existence of these theories implies that they are not exclusive and that the phenomena of learning is much more complex than conceived in the theories described above.

2.2 Factors related to professional learning

2.2.1 Goal rationalities or learning frameworks of professional learning within the workplace

Modern theories behind professional learning acknowledge that learning cannot often be described simply as taking place through a single mechanism or with simply defined objectives and results. Nieuwenhuis and Van Woerkom (2007) introduced the idea of goal rationalities to help describe the different frameworks within which professional learning takes place. Each framework tries to describe people, places, and purposes of learning.

In the preparatory stage, the objective of learning is to meet pre-defined outcomes, determined to be necessary to work in an occupational field. Learning usually takes places formally within a trade school or a university environment. The learning results are used to determine who will receive certification, which validates competence within the workplace. Usually, specific industries will work with schools to assist in the determination of these learning results.

In the personal goal stage, learning objectives and results are determined by the individual learner based on individual professional objectives. Though managers and industry trends may help in the determination of these objectives, the success of learning depends on the learner's agency.

The third stage within which professional learning is grouped is the optimizing rationality. Here, learning is viewed as the end result of working processes. In the optimizing rationality, learning is viewed as an outcome of the routine jobs and tasks which occur in a work environment. In the transformative rationality, learning is viewed as contributing to the long-term health and the survival of the organization. With the optimizing rationality, employees learn on the job; however, in the transformative rationality, they learn by questioning the assumptions of the tasks that they do and are involved actively in the continuous redesigning of their occupations. Nieuwenhuis and Van Woerkom (2007) state that the health of the learning culture in an organization is directly related to the general health of the organization. Workplaces can provide workers with learning opportunities for creativity and different kinds of transformations that are more profound than just mere improvement.

Professional Learning usually takes place within more than a single goal rationality and provides support for powerful collective learning collectively (Niewenhuis & Van Woerkom, 2007). For example, learning which occurs within the optimizing rationality can lead to learning within the transformative rationality as workers question the rationale behind routine tasks assignments. Usually, personal learning objectives are integrated into transformative objectives, and this can result in innovative thinking. These two goal rationalities lies behind the entrepreneur's learning. Lastly, the optimizing and preparatory rationalities can work together such as when an internship is included in a formal schooling course.

2.2.2 Review of Empirical research on Professional Learning

The connection between learning and work is acknowledged by many scholars as one that is close and compatible (Cairns, 2011). The two can be said to reinforce each other, and professional learning is perceived as a crucial element of lifelong learning. Learning from experience, which constitutes most of human learning in the workplace, is one of the key parts of adult learning theory.

The significance of the workplace as a site of professional learning has been acknowledged by most scholars in this field of study. Tynjälä (2008) examines the type of learning that occurs at the workplace and categorizes observable learning in any environment into three groups known as *metaphors for learning*: knowledge creation, participation (as in the communities of practice), and knowledge acquisition (as in formal learning). Of the three, Tynjälä (2008) concludes that knowledge creation and participation metaphors describe professional learning, while knowledge acquisition metaphor describes a small percentage of professional learning. Research has consistently found that among workers, the most favored professional learning strategies are informal, and that informal learning has a strong influence on professional learning (Bierema & Eraut, 2004). In a study among low-level employees in the retail sector, it was found that even though the workers did not have any opportunities for formal training while working, they were able to come up with novel ways of learning while working, and even learned through problem-solving (McPherson & Wang, 2014). Even in a professional workplace where formal learning is mandatory, workers found more value when using informal learning methods.

Tynjälä (2008) looked at the gap between what a person learns in formal schooling, particularly in higher education, and the skills, attitudes, and knowledge that are necessary for success in the workplace. The findings showed that practical skills and theoretical knowledge usually transfer well into the workplace, formal learning normally does not produce the knowledge and skills for the worker to be successful in the profession. Universities and colleges can solve this problem by partnering with the industry to provide practicums for the purpose of professional learning (Tynjälä, 2008).

In a Canadian study of accountants, it was found that management spent a significant amount of money and time in providing training opportunities to the accountants (Hicks, Bagg, Doyle & Young, 2007). Yet, when they were interviewed about the experiences, the employees disclosed that they seldom took advantage of these opportunities unless they were instructed to do so; they found learning informally while on the job more valuable (Hicks, Bagg, Doyle & Young, 2007). Formal learning may have a few advantages, though it is very expensive and usually it is not justified by a good return on investment (ROI). Developing formal training takes time and money and requires employees to spend time away from the work. (Lukosch & De Vries, 2009).

Approximately 70 to 90 percent of the learning that occurs in the workplace is informal in nature (Chivers, 2011; Eraut, 2011; Lukosch & de Vries, 2009; Watkins & Marsick, 1992). Consequently, it seems that organizations should financially invest in innovations that foster and encourage informal professional learning. Overall, informal professional learning is usually ignored by many employers and they only consider informal learning to be part of job performance, ignoring any benefits from informal professional learning.

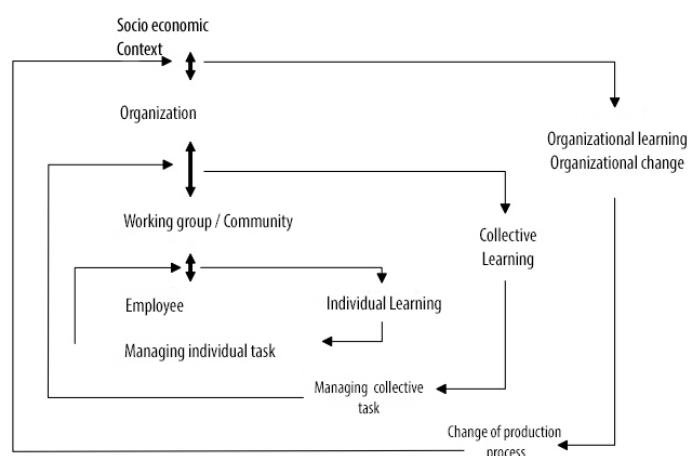
Knowledge is the core driving force within organizations today. In today's economy, it is important for organizations to have an adaptable workforce with a changing set of skills and the ability to constantly learn. The Tayloristic approach is no longer sufficient for the survival of companies in the current dynamic and complex environment. It is more sensible for employers to develop and encourage informal learning programs instead of spending time and money on expensive learning programs that foster skills which can become outdated.

In a seminal article about low-skilled workers in the retail industry, Roberts (2012) concluded that the existing formal learning opportunities did not provide opportunities for development but instead demoralized employees. In most cases, these formal training opportunities did not help the workers to perform their job responsibilities better. Therefore, there is no need for organizations to heavily invest in formal training programs, when the employees can become better performers through informal job training. Compared to formal learning, informal learning is more likely to deliver what is needed and when it is required (Doornbos, Simons & Denessen, 2008). Human resource departments have been slow to accept this fact. According to Doornbos, Simons and Denessen (2008), the field of human resource development has a rich history of focusing on formal work-related learning programs such as coaching and mentoring projects. Chivers (2011) argues that human resource departments need to pay more attention to informal professional learning since formal learning is on the verge of becoming obsolete.

2.3 Factors related to Professional learning

This section of the dissertation provides a review of the concept of professional learning and factors that influence it at different levels ranging from micro (individual and team) to meso level (organisation and context) (Hoeve & Nieuwenhuis, 2008).

Figure 3. Diagram of layers analyzed in this study



Source: Hoeve and Nieuwenhuis, 2008 (adapted by the researcher)

There is a wide range of definitions about professional learning. These definitions vary depending on the perspective and the discipline, ranging from andragogy, sociology, cognitive psychology and policy studies to management theory, learning theory and industrial psychology (Hager, 2001). Lave (1988) and Lave and Wenger (1991) define learning as a natural part of human activity. According to their theory, learning happens through participation in communities of practice. In other words, learning is a process of enculturation and newcomers become a member of communities of practices. Communities of practices depict the group of people who share a common passion for common practice, share ideas and insights, and learn how to do it better through regular interaction (Patel, 2018).

According to the Situated Theory, the learning context in which learning takes place is critical, as are the tools and social interaction with others. Therefore, learning is not an individual cognitive process, but it is constructed by social interactions between people in a particular context and with specific tools and artefacts (Wenger, 1999). Learning theory highlights that learning is effective when the participant is involved in the learning process, it takes place in collaborative form and the learning context is relevant to the learner. In a professional learning context, the theory elaborates that learning setting is important and engaging in actual practice provides an opportunity for situated learning (Berta, et al., 2015). Billett's (2001, 2004) theory of professional learning focuses on how the interaction between constraints and affordances of work setting and agency of individual employee regulate professional learning. Professional learning defines the way in which knowledge is acquired and skills are upgraded at the place of work. According to Collin et al. (2011), professional learning occurs through work-related interactions and contributes to learning of both individual and the organisation as a whole (Felstead et al, 2005; Fenwick, 2008; Doornbos et al, 2008). Moreover, Herrington, Reeves, and Oliver (2014) state that learning occurs through dynamic relations between the individual and collective actors. Professional learning can enhance skills through both formal and informal education narrowly focused skills. According to Yeo (2008), 80% of the workplace learning occurs through informal approach and this includes networking, self-directed learning, mentoring, and coaching. Therefore,

informal learning constitutes a larger part of learning and occurs through social interactions and systems of organization.

Professional learning elaborates learning as the consequence of participation in social practices with limited participation in educational activities. Participation in social activities includes interaction on a personal level as well as being active within the physical environment and organizational culture that constitutes the workplace. Due to the political nature of professional learning individuals engage in learning in a way that best serves their purposes and interests to increase career trajectory, secure opportunities and locate easy work options (Farnsworth, Kleanthous & Wenger-Trayner, 2016). The workplace setting regulates individual participation in workplace activities and is important for organisational success and survival as well as in the interest of certain groups and individuals thorough workplace affiliations, social norms and demarcation (Dochy, Smet, Govaerts, & Kyndt, 2018).

2.3.1 The importance of professional learning

Across various sectors such as the governmental, educational and corporate, the workplace is widely recognized as one of the primary places where learning occurs (Cheetham & Chivers, 2001; Eraut, 2004). This trend has been observed internationally (Boud and Garrick, 2001), as well as within the European Union (European Commission, 2013).

The workplace is a permanently evolving institution whose needs evolve over time and requires dynamic skills that education and training systems can provide (Halász, 2011). Research on professional learning is crucial, as it supports policies and practices associated with social and economic growth in the context of global competition (Chisholm & Fennes, 2006; European Commission, 2013). Research on professional learning is necessary to further improve initiatives related to education, occupational productivity, and the economy. Moreover, researching professional learning additionally benefits individual learning experiences within the above stated contexts.

For example, within the educational sphere, professional learning is a strong part of lifelong learning since up to 80% of adult learning takes place in a working environment (Cacciattolo, 2015). Also, professional learning plays a significant role within corporate environments. As professional learning practices and initiatives are closely linked to productivity, they have a

large impact on the development of the worker (Boud & Garrick, 2001; Ashton and Sung 2002). In being exposed to rich-learning environments within the workplace, the worker is more likely to react positively to career development opportunities, like education and training (Brown et al., 2010, as cited in Sweet 2013). Such career developments ultimately help to reduce employee errors, while introducing advanced technology and enhancing workers' employability. Notably, an increased employability profile enables workers to meet market skill shortage needs more readily (Panagiotakopoulos, 2011, p. 358).

Furthermore, in the interest of increasing levels of worker's performance and productivity, the corporate sphere has frequently sought to enhance the worker's effectiveness through professional learning. In this way, professional learning can be conducted through both formal and informal means.

Certainly, training is a vital element of professional learning. To that end, governments and corporations invest considerably in promoting on-the-job training (Booth, 1991). However, *positive transfer of training*¹ does not always occur optimally, with only 10 to 15 percent of the employee training results transferring to the workplace context (Broad & Newstrom, 1992; Burke & Baldwin, 1999; Facticeau, Dobbins, Russell, Ladd, & Kudisch, 1995 as cited in Cromwell and Kolb, 2004, p. 450). That is, this kind of on-the-job training accounts for a very low percentage of the total skills, knowledge and attitudes gained in an occupational training situation. If just 15% of on-the-job training is successfully transferred to the actual workplace, then the remaining knowledge and skills acquired through informal learning is of importance.

2.3.2 Types of Professional learning

Informal learning refers to the learning that is attained through everyday work and life. It is usually unplanned and unstructured, and it occurs outside any formal learning structures. Typically, it does not result in any formal recognition or any type of certification. However, it can be used for acquiring formal qualifications (Callanan, Cervantes & Loomis,

¹ Positive transfer of training is defined as the degree to which trainees effectively apply the knowledge, skills, and attitudes gained in a training context to the job (Newstrom, 1986 as cited in Cromwell and Kolb, 2004, p. 450).

2011). Contextual reasoning is a primary feature of informal learning, producing tacit and implicit knowledge. The prominent feature of informal learning is its foundation in experience, which is, in the way individuals make sense of their day-to-day lives. Informal learning does not have a design that is imposed by formal learning. Learning is marked by process of inquiry that happens in the form of a reflective conversation with circumstance. Intrinsic motivation is a key feature of informal learning. (Evans & Waite, 2010) Informal learning gives the learner more control as compared to formal learning, and it can be unplanned or planned. Informal learning usually has a social dimension to it. Informal learning in the workplace involves praxis- the process of action and reflection which takes place in an unceasing feedback loop. In general, informal learning can be thought of as part of growing up and maturing as an adult (Taber, 2009)

Informal learning takes several forms in the workplace. There are fewer visible methods of informal learning which are not essentially acknowledged as learning by employees or by the researchers observing them. Then, there is informal learning that is deliberate in nature and therefore acknowledged and describable by learners.

There are different kinds of informal learning that are described in literature as having the two elements. First, formalized informal learning is an intentional type of learning that can be easily identified as learning by both observers and participants (Wilson & Hartung, 2015). The types of informal learning methods are described below based on the work of Levinsen & Sørensen (2011).

a. “Organized” Informal Learning

i. Mentorships

Coaching or mentoring relationships are semi-formally or formally recognized as such by the participants. Mentoring relationships are naturally informal and are not always formally acknowledged by the organization. Informal mentoring relationships run the risk of being ineffective if they do not have in-built special arrangements for supporting the relationships.

These special arrangements include: guidance that is specific to the workplace, adequate preparation for mentee and mentor roles, and time set aside to dedicate to the relationship.

ii. Apprenticeships

Apprenticeships involve the transfer of knowledge between an expert in a skilled field, and a newcomer who is looking to gain some experience within the workplace. Although apprenticeships represented an early pre-industrial type of informal learning, the idea of the apprenticeship has gained attention in recent years due to the knowledge-based economy (European Union, 2000) and the focus on building communities within the workplace. Within apprenticeships, newcomers are integrated into their chosen profession through communities of practice. Instead of learning from just one master of their craft as in the pre-industrial times, newcomers learn from communities of practitioners. From the individual's perspective being exposed to real workplace scenarios like apprenticeships has a lot of effects, for example, for students and young people transitioning to working life it supports career decision making and the development of maturity and personal identity (Sweet, 2013) From the educational perspective, work-based learning is a powerful form of pedagogy since it supports the development of basic work habits, problem-solving and learning skills; in addition of developing an initial understanding of skills application in real life situations that demand context interaction that can hardly be reproduced in a classroom (Sweet, 2013) Also, based on a study carried out by OECD (2010) there is a higher probability for youngsters between 15-19 years old of getting employed if they have been involved in any type of work-study situation before leaving school (Hoeckel, & Schwartz, 2010)

iii. Intentional Informal Learning

This type of learning is also known as informal deliberative learning. With this method, workers initiate and structure learning according to their preferences. Learners determine the objectives, time, and place of the learning, and the methods that they will use to monitor the learning process. Tynjälä (2008) describes this type of learning as situations in which there is no defined work-based objective, and learning is the most likely end-product of the process.

b. Unconscious Informal Learning

There are several hidden types of professional learning that are usually hard for employers and employees to acknowledge as learning (McLaughlin, 1990). Described below there is a number of ways researchers have named these types of hidden professional learning methods:

i. Incidental Learning

Incidental Learning is an individual activity yet it can take place in a social environment. In fact, Le Clus (2011) describes incidental learning as an activity that takes place as a result of social processes. Le Clus (2011) refers to such competencies as knowing how to learn, creative thinking, problem-solving, interpersonal skills, leadership effectiveness, communication skills, and ability to work in a team; and they are learned incidentally during social interactions. Tynjala (2008) states that incidental learning produces tacit knowledge. Tacit knowledge is important for practical intelligence and this leads to professional success.

ii. Tacit Knowledge

Tacit knowledge is a critical component of an improved skill set and success in the workplace. It comes as an outcome of experience over time, and it cannot be easily transferred to newcomers. It is contextual, personal, and cannot always be articulated through speech. Tacit knowledge may be consciously known or unknown to the learner (Le Chus, 2011). Evans and Waite (2010) observe that tacit knowledge is usually known as know-how and it involves sophisticated connections between personal knowledge and skill formation developed through experience. Tacit knowledge is not only a process of knowledge acquisition but also the processing of knowledge. One of the drawbacks of tacit knowledge is that it can easily result in errors since inaccurate evaluations, judgements, inferences, and assumptions are made which are never examined to ascertain their accuracy.

Not all researchers and authors see tacit learning as just an individual activity. Pankhurst (2010) and Li et al. (2009) view tacit knowledge as something which takes place at the organizational level. In this framework, tacit knowledge is knowledge within an organization that has not been stored or captured in some way e.g., knowledge base intranet, documentation, or email. When this type of organizational knowledge is captured, it becomes explicit.

iii. Situated Learning

This type of learning includes tacit learning which is entrenched in daily work activities. It can be contrasted with formal learning, where learning is a separate activity from daily life. Situated learning is not designed to be a separate activity, but it is a natural aspect of living (Billet, 1996)

iv. Collateral Learning

This is tacit learning which comes from doing something with the lack of the intention to learn something new. It can also be defined as the capacity to ensure that collateral learning is translated across professions and jobs for any individual learner (Herbert, 2008)

2.4 Factors linked to professional learning

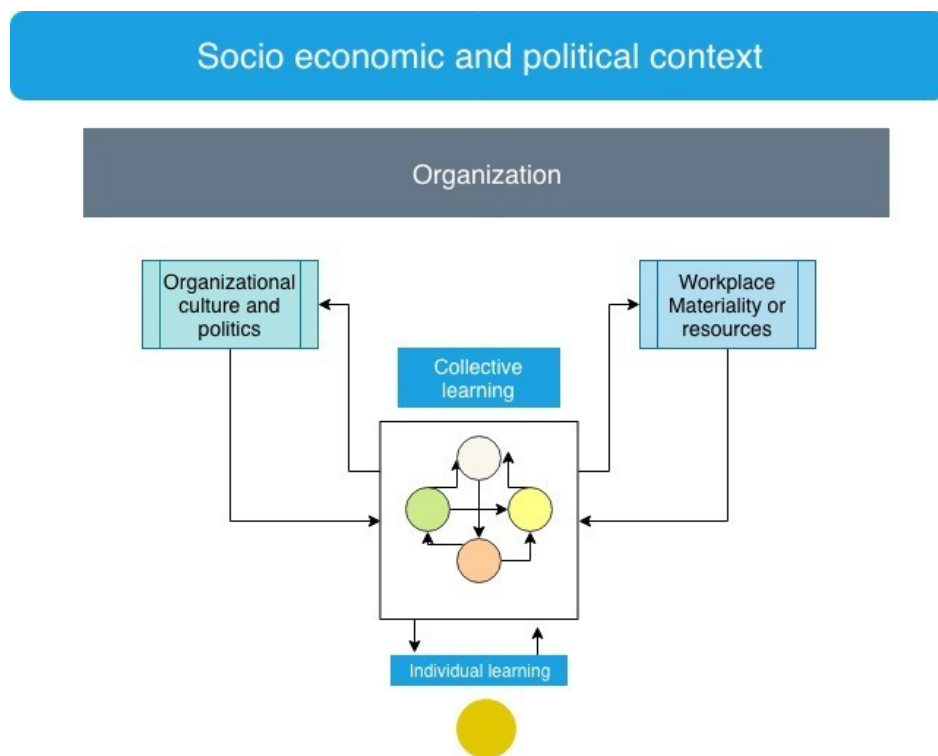
Studies about professional learning greatly differ in nature and approach; however, two main strands can be identified: a) developmental psychology, cognitive and individual learning theories, and b) Contextual, sociocultural and constructivist learning theories, (Cheetman and Chivers 2001; Elkjaer, Høyrup and Pedersen 2006, p. 22). Some scholars have studied learning from the point of view of the interrelation of both strands (Fenwick, 2000; Granberg and Ohlsson, 2005). Graham and Chivers (2001) focused their research in formative experiences as general kinds of Learning mechanisms and developed a taxonomy of informal learning methods, making informal learning activities the focus of their research.

Using a broader perspective, Eraut (2004) studied general factors involved in the occurrence of informal learning in the workplace. Other research studies examined the relationship between workers personal learning and informal learning engagement with supportive learning environments (Ellinger, 2005; Shelley & Chyung, 2008; Choi & Jacobs, 2011). Kim and McLean (2014) conducted research about informal learning in the workplace with a special focus on cultural factors.

Although this thesis is directed towards individual professional learning, it is necessary to have an holistic vision of all the contextual elements that could affect the development of professional learning. Consequently, an exhaustive search of studies that involved professional learning elements, structures or circumstances was conducted. Örténblad (2001) defines professional learning as a situated social phenomenon, whereby the elements of the

place in which learning takes place are of paramount importance. To identify several elements that could affect professional learning, this study organized those elements in a hierarchical fashion with the following structure:

Figure 4. Elements that may affect professional learning based on literature review



Source: Researcher

2.4.1 Framework of Professional learning

Crossan, Lane and White (1999) proposed a framework consisting of four linked sub processes known as intuiting, interpretation, integrating and institutionalizing. The processes take place at three levels which are individual (intuiting and interpretation), group (integrating) and organization (institutionalizing) as summarized in the table below:

Table 1. Professional learning processes

Level	Individual	Group	Organization
Process	Intuition and Interpretation	Integration	Institutionalization
Inputs and outputs	Experiences and metaphors	Shared vision, understanding, interactive systems	Rules, routines and procedures

Source: Crossan, Lane and White (1999)

Intuition is the ability to understand things instinctively without conscious reasoning. Intuition is a subconscious process and occurs when people assimilate and understand new ideas. Intuition is starting phase of acquisition of new ideas and learning is a conscious process occurring at individual, team or organization level. Intuition includes a set of possibilities and patterns and a process of recognizing past events. In an individual context, when individuals are in a known situation they instinctively behave in the same way because they recognize past events. An individual can find metaphors for concepts and share these metaphors with others which result in collective interpretation and marks the starting point for the interpretation process. Interpreting is a conscious process and at this stage, individuals develop cognitive maps about multiple domains. The cognitive maps are influenced by the environment because it guides the interpretation. Every person is different and unique and thinks differently and thus, people's behavior is connected to the cognitive map. In interpreting, language is a critical element because it empowers the individual to express events. The common language reinforces patterns, making it possible to understand and recognize during the interpreting process. The objective of integrating is for coherent and collective action. For coherence, it is important that group members have a common understanding as well as shared practices and constant conversations to develop collective understanding. At this stage, language is important and can be fostered through dialogues and conservation to establish and evolve meaning. A dialogue depicts collective learning and transforms conservation quality and thinking behind it. Finally, institutionalizing separates organization learning from individual learning and individual learning can be combined and institutionalized within the organization. Individuals join and leave the organization but what they learn as individuals or in a group can remain in the organization as a source of

knowledge. This knowledge is embedded in structures, strategy, systems and practices of the organization. The transfer of learning from individual to group and consequently to organization level is a time-consuming task. The challenge for organizations is to balance existing and new learning systems to develop intuiting, interpreting and integrating processes.

2.4.2 Contextual Factors affecting Informal Learning

Learning that is valuable or useful can also occur outside the workplace. Life skills are constantly gained and upgraded by adults all through their working life, and even beyond, and these life skills are usually acquired in a community environment or at home. In turn, these life skills can be very invaluable for an individual's success in the workplace. Pankhurst (2010) describes the integration of informal work-related learning with non-work-related informal learning. Pankhurst (2010) states that although informal learning is rare among employees with repetitive, low-level, and low-paying jobs, there are workers who can integrate learning from their activities, interests, and hobbies outside of the workplace into their jobs.

Nonetheless, this section will concentrate on informal learning which can be identified as occurring in the workplace. The place where informal learning occurs is very important. Learning is deeply rooted in action in the culture of the workplace, and in the organization in general. Contextual factors which can affect informal learning include physical, social, and cultural factors which are present in the workplace.

i. Social and economic factors

The social economic perspective is not part of the main framework of professional learning, yet it is important because it provides context in which professional learning occurs. In an economic context, all learning activities become an investment and the individuals make this investment with the belief that their efforts will be fruitful in the future. The investment characteristics are based on 'human capital theory' and the focus is 'rate of return on investment' and typically occurs during initial education.

ii. Organizational Factors

Organisational factors relate to how work organizations are structured (whether they are flattened or hierarchical for instance), what type of reporting arrangements there are, and the type of climate that exists as it relates to learning. They can also include restrictive vs. expansive environments where innovation and learning come from the top down and ground up respectively. The concept of organization and organizational factors will be developed more broadly in the next section.

2.4.3 Organization

Organizations are multi-layered social worlds, or entities that include human and non-human actors and have shared perspectives, activities, and discourses. They have the duality of stability and change that is manifested in formal structures that are enacted, negotiated, and redefined by organization members (Popova-Nowak & Cseh, 2015, p. 315) Since organizations are social worlds, it is natural to think that those worlds are shaped by their members, structures, function, clients, etc. The learning organization is a work environment in which “people continually expand their capacity to create desired results they truly desire and expansive patterns of thinking are nurtured where collective aspiration is set free, and where people are continually learning how to learn together” (Senge, 1990, p.3 in Berg & Chyung, 2008) When viewed as a culture, the learning organization is defined by an implicit set of shared meanings and values amongst its people that yields learning and knowledge transmission (Berg & Chyung, 2008, p. 229)

2.4.3.1 Organization’s culture and learning

According to Schein (2010), ‘culture is defined the way we do things here’, and Alvesson (2012) explained that organization culture depicts the underlying assumptions, beliefs, values and behaviors which are molded within an organization over time and represent mechanisms of socialization and climate change. Organization culture is consistent and strong and has an important impact on the organization and its employees. Furthermore, Marsick and Watkins (2003) elaborated that organization culture is a facilitating factor of a learning organization. Organization culture represents the way people think and behave and a good match between the two promote innovative behavior. On the other hand, a mismatch between people’s belief

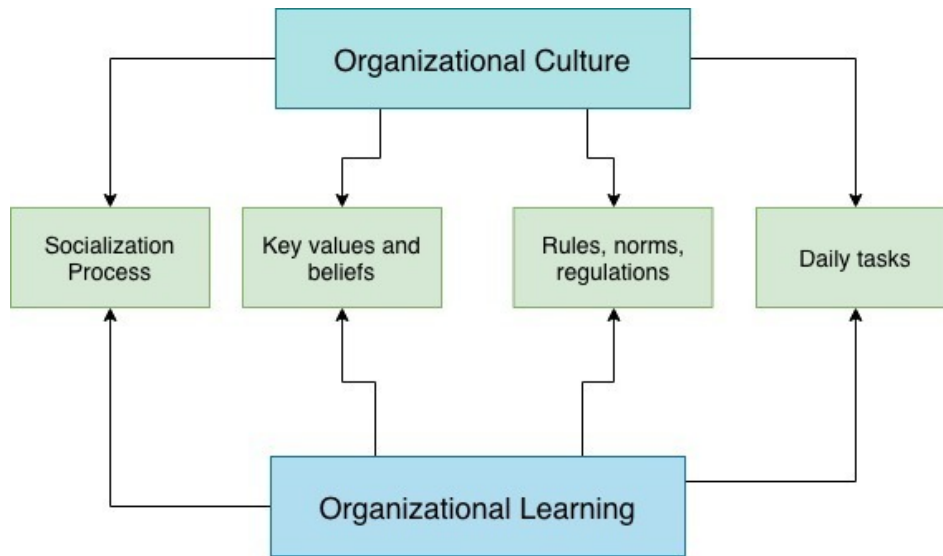
and behavior, involving inflexible hierarchies and restricted communication acts as a barrier to restrict both innovation and creativity. A learning organization culture emphasizes the facilitation and advancement of learning of its employees.

2.4.3.2 Organization culture influence on professional learning

In an organization learning context, organization culture is viewed as an adaptation instrument that enables the organization to survive in a changing environment. Organization culture consists of institutionalized phenomena that is difficult to change because it involves an arrangement of assumptions that the group has learnt and developed to handle its problems. In today's organization, employees are considered human capital and organizations provide a wide range of activities to assist individuals for development process. The purpose is to increase innovativeness, involvement and achieve constant improvement which may not be possible without constant learning. It is important for organizations to provide environments which encourage and disseminates learning, so organizational culture plays a vital role. The organization learning process needs to have a supportive culture to facilitate its systems and practices.

Organization culture has multiple consequences for both employees and organizations through its impacts on employees learning, behavior and development. The organization learning culture is a type of culture that cultivates organization learning through supporting acquisition and distribution of learning. Moreover, organization culture reinforces support for continuous learning and its application for organization improvement. A culture that promotes organization learning is characterized through an atmosphere of competition, strong communication, lack of arrogance and egoistic attitude, and a free exchange of ideas and information. Organizations achieve a competitive advantage through learning culture because their operations are beneficial to create and exchange new learning for the interest of the whole organization. Organization learning is supported through cultural components such as values, socialization, daily takes and management systems as shown in the figure below:

Figure 5. Relationship between organizational culture and organizational learning.



Source: Researcher

It is important that organizations increase learning using a variety of methods and from different sources. The visual elements of culture such as rituals, routines and stories create a sense of belonging among employees and transfer organizational values, fostering identification within the organization. The goal of the organization's culture is to encourage and promote an atmosphere and environment which sparks the learning process. A work culture which promotes innovation and recognizes creativity increase motivation to learn and produces new ideas and products. The fundamental assumption of learning theories is that learning is socially constructed, and what is learnt is connected to the context in which learning occurs. Therefore, the organization culture that promotes growth, prizes learning and share knowledge is important to stimulate organization learning.

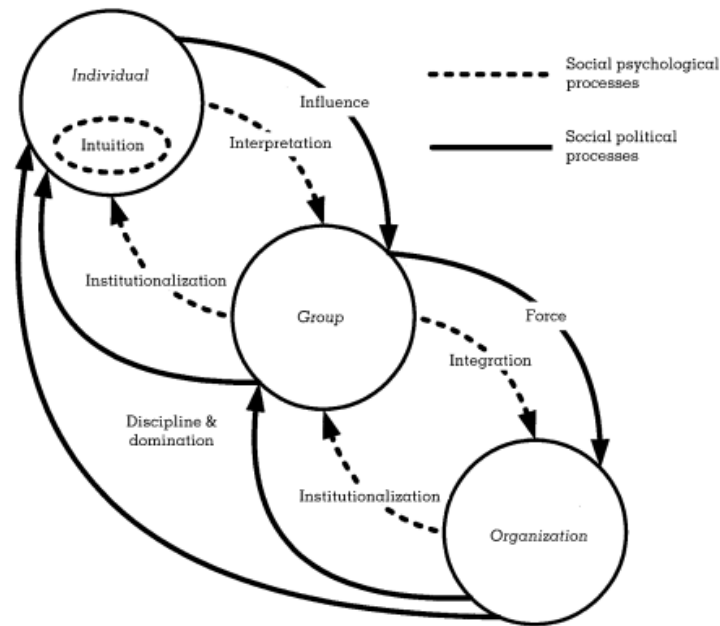
2.3.3.3 Organization politics

Organization politics can either promote or impede learning environment in an organization and make professional learning an unnatural process (Mallon et al., 2005). Moreover, Lave and Wenger (1991) discussed communities of practice model and elaborated that behaviors can promote learning in unanticipated ways through identifying political behavior and relations that promote learning. According to Fossen (2010), organization politics in an organization is encouraged through individual surroundings and cultural

circumstances. The literature reveals that employees experienced a number of political tactics in the workplace namely as 'Rival Camps Game', 'Counterinsurgency Game', 'Insurgency Game', 'Alliance game', 'Line vs. Staff' and 'Expertise Game' (Mintzberg, 1985), 'Reciprocity', 'Attacking others', 'Ingratiation', 'Impression Management', 'Developing Groups' (Allen et al., 1979), and 'Episodic Power' (Lawrence et al, 2005). This study specifically reviews power, politics and business organization at the level individual, group and the business itself.

Giddens (1984) and Lawrence et al (2001) work on power elaborates two distinct modes of power which are episodic and systematic, and both have distinct implications for learning. Episodic power is derived from strategic and discrete political acts initiated by the self-interest of actors and can influence decision-making. On the other hand, systematic power is a form of power which influences systems, routines and ongoing practices in an organization. Systematic power forms are diffused in organization structure and culture throughout the social systems. The communication of insights and ideas to other occurs through the process of interpreting. The contingent nature of such ideas being transferred is dependent upon the individuals involved and the environment in which such processes occur. The ideas that are successfully transformed through strong interpretation depend upon the episodic power of sponsors and their ability to influence behaviors, feelings, and thoughts of people around them. Moreover, in the process of integrating, the actors engaged in the transformations have periods of power. Once an idea is translated into legitimate interpretation, then it can be integrated into a group of activities. The interpretation of individuals can be transferred to the group and integrated into group activities. During moments of doubts, these ideas can be revised in order to define the imaginations and identity of workers and inspire collective actions. The interpretation and integration stages depend upon episodic forms of power. On the other hand, institutionalizing involves transferring ideas from the organization to the individual. The institutionalization of ideas promotes individual and group learning through embedding new routines, procedures, systems and ideas that structure organization's life. The concept of systematic power beginnings to address the issues when new ideas institutionalized is shown in the diagram below:

Figure 6. Organization politics map



Source: Gossan et al. 1999

The linkage of episodic power to interpretation and integration and systemic power to intuition and institutionalizing processes provides the foundation for understanding the relationship between organizational politics and organizational learning. The two forms of strategies associated with episodic forms are force and influence and with systematic power are discipline and domination as summarized in the table below:

Table 2. Process-power relation dynamics

Process and Power	Description	What?	How?	Example
Intuition	It involves recognition of possibilities and patterns inherent in personal experiences	Develops identities and provides patterns of recognition	Costs and benefits of behaviours	Training Socialization Team work
Interpretation	It is the process of explaining through actions and words providing an insight	Manage uncertainty and ambiguity and construction of cognitive maps	Cost and benefit of behaviours	Negotiation Integration
Integration	Develop share understanding among teams and individuals	Translating the new ideas for team members	Episodic restricting behaviours	Limited decision alternatives Agenda setting

				Removing opponents
Institutionalization	It embeds the learning incurred by individuals and groups	Overcomes the resistance to change	Systemic restricting behaviours	Physical layout Materials

2.4.4 Human Environment

2.4.4.1 Supervisors/ Managers

The responsibility of the supervisors and managers in creating a favorable environment for professional learning is important. Leaders must show commitment to learning, by both demonstrating their personal commitment to their learning and by encouraging, supporting and reinforcing the significance of developing others. In an ethnographic study that extensively looked at the informal learning of teachers, Jurasaitė-Harbison and Rex (2009), found that despite the learning orientation of the managers, and the learning climate which they provided to the teachers, they still found a significant number of ways to informally learn while on the job.

2.4.4.2 Co-workers and Colleagues

Interactions and discussions with work colleagues are important for the synthesis of professional learning. In this type of environment, workers liaise and collaborate with each other and draw on domain-specific experts to bring knowledge to workplace problems (Hicks et al., 2007).

2.4.5 Collective Learning

Professional Learning takes place in a social context, and many theorists and researchers believe that it is only through the social context that learning can be well understood. Two metaphors that are usually used for learning are language as participation and learning as acquisition, describing social learning and individual learning respectively. These two concepts feed and support each other and are equally important within the workplace environment.

Örtenblad (2001) defines professional learning as a situated social phenomenon that involves the participation of collectives such as communities of practice.

In conceptualizing Communities of Practice, Lave and Wagner (1991) view learning as a social constructivist process moving toward full participation within sociocultural practices of a community. In a Community of Practice, learning is perceived as a situated activity with a main characteristic called “Legitimate Peripheral Participation” in which newcomers join a pre-established community and gradually adopt their knowledge, culture and identity through the participation in their activities (Lave & Wagner, 1991, p.29). Simultaneously (Brown and Duguid, 1991, p.41) also worked with the concept of situated learning which they defined as a “fluid evolution of learning through practice” seeing learning as the bridge between working, learning and innovation.

An effective learning community is the *“community that has the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning.”* (Bolam, McMahon, Stoll, Thomas, Wallace, Greenwood, & Smith, 2005) Professional learning communities must possess eight characteristics to be effective. Successful communities have a common vision and goal, they share a collective responsibility for pupil’s learning, the collaboration is focused on learning and improving, the professional learning is both individual and collective, the efforts involve reflective professional enquiry, the communities are open to networking and partnerships, have inclusive membership and are based on mutual trust, respect and support. (Bolam, et. al., 2005). With the widespread influence of the internet, professional learning communities can also be maintained and joined online.

Internet and social media are also important tools that can be utilized to create online professional learning communities for teachers where they can discuss, advise and learn the various aspects, issues and practices, by their peers - without borders. Online communities are increasingly being used by teachers and instructors to discuss various teaching practices for various disciplines. These online communities also help teachers and instructors to have meaningful conversations with their peers allowing them to get informal advice about their respective professions (Duncan-Howell, 2010).

2.4.5.1 Communities of Practice

Both individual and social learning usually takes place in the context of communities of practice in a workplace. A community of practice is an environment in which social learning activity takes place (Lave & Wenger, 1991). A community of practice also involves a group of individuals who share a concern, a set of issues, or a passion about a particular topic, and who increase their knowledge and expertise in this particular area through interaction on an on-going basis (Guldborg & Mackness, 2009), either through face-to-face meetings or through informational technology connections.

Individuals who participate in communities of practice are usually self-chosen and are motivated to learn. They usually meet in informal places to discuss issues that are of interest to the group. Employees can be involved in more than one community practice. These communities of practice can pertain to several aspects of their job. Individuals who are engaged in several multiple communities of practice are at times known as “boundary spanners”.

In conducting research on health experts, Traut concluded that the term “community of practice” is not suitable in the description of what is observable in the field regarding professional learning. Wenger’s three dimensions of participation, joint enterprise, and mutual engagement are also important and do not necessarily require a formal community practice forum (Cairns, 2011). Learning as social participation and situated learning can capture the fundamental essence of activities that occur within communities of practice.

Another critique of the idea of communities of practice is that it is too inflexible when it comes to an understanding of the way in which individuals socially learn in the workplace. For example, communities of practice’s concept that knowledge can be captured and facilitated using information technologies is an inflexible view of learning and does not adequately describe the manner in which individuals learn informally in the workplace (Cairns., 2011). The rigid models or theories of informal learning force us to think dualistically, when often what we observe is not as simple as it may seem.

The role of communities in the process of learning and knowledge generation has attracted much attention in recent years in the context of intra and inter-organizational knowledge transfer. (Roberts, 2006, p.2)

Lave and Wenger's (1991) seminal job on situated learning and communities of practice (CoP) made one of its first appearances in the literature whereby CoPs were defined as "a system of relationships between people, activities and the world; developing with time, and in relation to other tangential and overlapping communities of practice" (Lave & Wenger, 1991, p. 98)

2.4.6 Individual Professional Learning

Learning is largely associated with a sense of identity and self so investigating learning as a personal action of knowledge construction, the learning process involves issues of roles, demographic characteristics, and personality traits (Lans, Biemans, Verstegen & Mulder, 2008).

Below each of the dimensions related to informal professional learning from the "individual" point of view are presented.

There are different theories about how people learn. Due to the characteristics of this study, I chose to focus on the Experiential Learning Model because of my belief that Recognition of Non-formal and Informal learning processes is important not just for achieving social inclusion and economic improvement, but it is also related to recognizing that learning is an inherent part of being human. This is how Dewey (1938, p35) conceives learning:

The principle of continuity of experience means that every experience both takes something from those which have gone before and modifies in some way the quality of those which come after.... As an individual passes from one situation to another, his world, his environment, expands or contracts. He does not find himself living in another world but in a different part or aspect of one and the same world. What he has learned in the way of knowledge and skill in one situation becomes an instrument of understanding and dealing effectively with the situations that follow. The process goes on as long as life and learning continue.

In the last paragraph, Dewey explains "experience" as a construct of ideas of mutable nature that are formed and re-formed by previous and new experiences. One can consider

this experience as the basis of experiential learning. For Kolb (1984) experiential learning theory offers a unique view of the learning process and is called “experiential” for two main reasons. The first is to tie it clearly to its intellectual origins in the work of Dewey, Lewin and Piaget, and the second reason is to emphasize the vital role that experience plays in the learning process. In Experiential learning theory, learning is viewed as a process of the individual’s adaptation to the environment, such as home, school, workplace, or library. Across environments, learning follows the same process in all stages of life, from childhood to old age. Experiential learning is a holistic-adaptive lifelong process which incorporates other concepts such as creativity, problem solving, decision making, and attitude, providing conceptual bridges across life situations (Ib. 21) Accordingly, experience has an internal and external dual perspective. For example, in a professional learning situation a group of apprentices could be exposed to the same learning environment and external influences but what they learn will depend on their own particular learning process and previous experiences. For example, one of the apprentices could have had practice in the management of a certain method or process and is learning how to refine it, but for another apprentice it could be the first time relating to that method and is, for instance, just learning how to use it. This example shows how the learning process differs from one person to another.

From Kolb’s perspective, every experience has an active component which changes in some degree the objective conditions under which experiences are gained. Learning from the experiential perspective is defined as the process whereby knowledge is created through the transformation of experience. This is how people learn from real life situations.

2.4.6.1 Individual characteristics

Individual characteristics can play a vital role in whether and to what degree professional learning will yield meaningful results for the individual or for the organization. As Jarvis (2006) defined, learning is “a complex set of human processes that are in some ways extremely difficult to understand” (p. 4) those processes are related to environmental, contextual and personal characteristics, the latter is analysed in the following lines:

a. Age

The age of the employees plays a central role in participation within professional learning that the workers will take part in. Research on age has uncovered the following findings:

- Older employees tend to prefer personal forms of learning, while younger employees prefer social situations for informal professional learning (Myers & Sadaghiani, 2010).
- In a study that was carried out among firefighters, a new system of responding to fire emergencies was introduced in the workplace. The younger workers demonstrated a considerably greater capacity to adapt to the new system, while the older workers demonstrated a greater knowledge of firefighting in general (Taber et al., 2008)
- Younger workers learn informally from, older workers through observation; older workers learn from younger workers when they mentor them.
- Schulz and Stamov (2010) found that there was no correlation between informal learning outcomes and age-related cognition. This may be a result of the healthy worker effect, whereby older workers, who had not yet retired, still anticipate to be working and so learning for future professional and organizational needs seemed worthwhile.
- In a research study on Dutch police officers, it was found that the tenure of the police was negatively linked with the frequency of the learning activities (Doornbos, Simons & Denessen, 2008).
- A study of employees in investment banking organisations found that the older investment bankers could reflect more comprehensively on the issues of learning and training in investment banking while the younger staff were similarly insightful and stimulating since they were living through a period of quick learning during the early stages of their professions (Chivers, 2011)

Overall, apart from the study on Dutch police officers, it seems that there is not a considerable difference in the quantity or quality of learning in older and younger employees.

b. Attitude

Learner attitude can either hamper or drive professional learning's efficiency (Chivers, 2011). This is particularly true for informal learning as the center of control lies within the person as opposed to the educators. Confidence that informal learning will result in positive

outcomes is a big attitudinal factor. For instance, workers who are confident in their learning success can gain important knowledge and skills in both informal and formal learning.

c. Motivation

Intrinsic motivation is an essential element for the success of informal learning. There are a number of factors which can be described as the source of motivation. Employees can have a learning objective orientation, in which they primarily learn to increase their knowledge and skills, or a performance goal orientation, in which the learners primarily seek to demonstrate the particular skills that they have mastered so is a form of competition between the learner and others within the group (Nieuwenhuis & Van Woerkom, 2007).

Motivation is also important for professional goals. Workers in the current marketplace can either pursue a protean career (spanning several organisations) as opposed to an organization career (staying with one organization). This protean career is grounded in self-direction and the pursuit of psychological success in an individual's work and needs a high level of personal responsibility and self-awareness.

d. Social Behaviour

Learning occurs not just at the individual level but also involves a social component. Employees who interact with other individuals in communities of practice might have different areas of expertise and this will open up new areas of informal learning. Additionally, professionals who are open about sharing their knowledge and ideas, can be described as visionaries who bring change because of their bridging efforts and extensive networks. Workers who fail to network with other professionals to share knowledge will usually falter in their learning and fail to bring change to the workplace (Cairns, 2011).

e. Education Level

Literature on how formal education affects informal learning is not conclusive. Fuller et al. (2007) and Misko (2008) stated that those workers who had lower education levels as they grew up had fewer opportunities at the workplace for both formal and informal learning, and therefore they did not gain any benefits from it. However, Berg (2008) found through statistical analysis that such a difference did not exist.

f. Personal Characteristics

Personal characteristics like a propensity for anxiety and risk-taking, tolerance of ambiguity, social independence, and a desire for autonomy are also positively linked to creative or innovative achievement. Hicks et al. (2007) stated that being curious is also an essential element of the informal learning process. Individual characteristics which are essential to informal learning can include the individual's value of work-related learning and perceived level of competence.

g. Learning Orientation

Learning orientation occurs when an individual is genuinely interested in and curious about learning. Individuals with a very strong learning orientation usually are able to create their own learning objectives and evaluation techniques (Schulz & Roßnagel, 2010)

h. Gender

This is a factor that has not been explored deeply in literature with regards to informal learning. Skule (2004) found that for all the levels of education, men had more learning intensive professions as compared to women. However, the difference is much bigger at the lower education levels.

i. What is Learned

What is learned during professional learning is important to anyone who is planning, learning and training for the future needs of the organisation. Tynjala (2008) discusses a 2004 study by Eraut and colleagues, who created a typology of learning results that can be measurable and visible in the workplace:

- i. Task performance, including sub-groups like collaborative work, the range of skills needed, and speed and fluency;
- ii. Awareness and understanding, which involves an understanding of problems risks, one's organisation, contexts and situations, and colleagues;
- iii. Personal development with different aspects such as the ability to learn from experience, building and sustaining relationships, handling emotions, and self-evaluation and management;
- iv. Teamwork with sub-groups like problem-solving, joint planning, and collaborative work;

- v. Role performance, including crisis management, delegation, supervisory role, and prioritisation;
- vi. Academic skills and knowledge, such as using knowledge sources, theoretical thinking, research-based practice, and assessing formal knowledge;
- vii. Problem-solving and decision making, for instance, decision making under pressure, group decision making, and dealing with complexities; and
- viii. Judgement, which includes levels of risk, value issues, priorities, output and outcomes, and quality of performance.

Since professional learning usually includes learning assessment as a critical part of the formal process, it is very easy to measure this type of work-related results when learning occurs as part of a formal mechanism. However, when learning is informally acquired, it is very difficult. Overall, informal professional learning has not received adequate attention, as demonstrated by Hunter's (2010) description of the content attributes, that are elements of formal learning.

Knowles (1984) based his own theory of adult learning called Andragogy on Lindeman's work and include six principles of andragogy: (1) the learner's need to know, (2) self-concept of the learner, (3) prior experience of the learner, (4) readiness to learn, (5) orientation to learning, and (6) motivation to learn (Knowles, Holton III, & Swanson, 2012).

This new andragogical model challenges previous archaic pedagogical models:

Table 3. Pedagogical and andragogical assumption about learners

No.	Aspect	Pedagogical Model	Andragogical Model
1.	Need to know	Learners need to know what the teacher tells them.	Learner need to know why something is important prior to learning it.
2.	The learner's self concept	Learner has a dependent personality.	Learners are responsible for their own decisions.
3.	The role of the learner's experience	The learner's experience is of little worth.	The learner's experience has great importance.
4.	Readiness to learn.	Learners become ready to learn what the teacher requires.	Learners become ready to learn when they see content as relevant to their lives.
5.	Orientation to learning	Learners expect subject centered content.	Learners expect life centered content.
6.	Motivation	Learners are motivated by external forces.	Learners are motivated by primarily by internal forces.

Source: Knowles et al. 1998

2.5 From Professional Learning to Professional Development

It is important to distinguish between professional learning and professional development. In this study, professional learning involves informal and implicit knowledge that professionals have and develop through daily work while professional development refers to training programs implemented within or outside the workplace in order to close a knowledge gap or to achieve organizational goals (Nassazi, 2013).

Professional development, in general, is associated with the acquisition of educational certifications and professional credentials that depict some level of competency of the holder. Professional development involves attainment of a certain degree of skill, acceptance by peers in the professional field, and to have the capability to promote the field of interest from the holder's unique perspective (Diaz-Maggioli, 2004). Professional development has become a synonym for training models for service-based industries under the assumption that teachers need direct instruction about how to improve their skills and master new strategies (Garet, Porter, Desimone, Birman, & Yoon, 2001).

Professional learning is described as “ownership over compliance, conversation over transmission, deep understanding over enacting rules and routines, and goal-directed activity over content coverage”. (Garet, Porter, Desimone, Birman, & Yoon, 2001)

2.5.1 Need for professional learning practices

The traditional pattern involving the professional learning of teachers and other has involved “academic” type coaching and workshops arranged by their respective schools, colleges and universities. The development of their skill set is enhanced through professional development through academic qualifications and annual training sessions. With the changing curriculum of academic subjects and courses and an increase in academic standards, teachers and instructors find it difficult to effectively teach and train the students. Students face several challenges to learn the course material and can lose interest (Martin, Kralger, Quatroche & Bauserman, 2014). Professional development has been rejected as the key policy lever by renowned educational policy makers and according to Eric Hanushek from the International Academy of Education and the International Institute of Educational Planning in UNESCO

“despite some success in general they (professional development programs) have been disappointing.” (Timperley, 2011)

Various studies conducted on the professional learning of teachers show that they have a positive impact on student achievement. In several countries, effective teacher learning is influenced by a number of factors including the availability of ample time for teachers' professional learning, extensive support and mentoring for instructors, and the involvement of teachers in the decision-making processes related to academia. Moreover, in European countries, the provision of government-assisted professional training and support for teachers and university instructors plays an important role (Darling-Hammond, Wei, Andree, Richardson & Orphanos, 2009).

Since the dynamics of professional learning and development are governed by feedback loops of uncertainty and several interactions of different variables, complexity theory provides a useful framework to understand the phenomena. In a review of the literature, Opfer and Pedder (2011) concluded that a process-product logic was prevalent in the available literature on professional learning and identified that the combination of the teacher, the school and the learning activity impacted the overall effectiveness of teacher learning. The research suggests that a methodological practice be utilized to improve teachers' professional learning (Opfer & Pedder, 2011).

Most of the available literature on professional learning has focused on teaching, probably because within other environments, the complexity of the situation involves several factors entangled in feedback loops. Moreover, the lack of emphasis on professional learning and the overemphasis on professional development is of concern. Eraut (2000) researched the conceptual and methodological problems and constraints in professional learning in the workplace, especially people-centric professions such as the human resources at various organizations. Eraut (2000) concluded that tactical knowledge is more important than professional development. Three types of knowledge were discussed including tactical understanding of a) people and situations; b) routinized actions; c) tacit rules that underpin intuitive decision making. Four types of processes govern the effectiveness of professional learning which include: reading the situation, making situation-specific decisions, routinized actions, overt activity, and metacognition. The research concluded that the variation in

people's career paths and cognitive abilities makes traditional professional development practices obsolete in the changing dynamics of the 21st century

The review of recent literature suggests that a systematic approach to professional learning should be, at the minimum, as equally emphasized as professional development. Professional development, within its own context, is outdated in terms of practice and review. Teachers fail to participate actively in professional development activities because they might value formalized education more since often times it's a requirement to advance in their careers and they may question the methods and practices being suggested and find it difficult to relate theory with practice. Teachers are motivated to learn when they are self-determined, the skills being offered to them are in line with their own beliefs and practices, and when they feel human connection and a sense of belonging in instruction seminars and practical workshops (Wilson, 2015). According to Knight (2000), professional development practices should also be put through radical change and a more practical approach should be taken whose aspects relate closely to professional learning. Moreover, professional development policies, programs and techniques should be constantly reviewed and altered for better implementation and better results. Professional learning can enhance the professional paths of teachers and other professionals through the fostering inquiry experimentation, knowledge creation, discussion, reflection, practice, collaboration and problem solving, improved understanding of theory and an efficient utilization of existing knowledge (Wilson, 2015).

2.5.2 The importance of professional learning practices

Professional learning is overshadowed in literature and practice by professional development because the latter is more objectively studied and has implementation strategies already in place in various disciplines. The emphasis on professional learning is minimal when it comes to education and other occupations. There is a need to understand the benefits of professional learning. This section discusses several beliefs and approaches to implementing professional learning practices.

Professional learning can be implemented in almost every professional discipline by following eight fundamental principles (Hirsh & Killion, 2009). The first principle is that values shape thoughts, words and actions. They are the fundamental beliefs that professionals hold, whether they work in education, human resources, IT or other fields.

When these personal principles and beliefs conflict with new strategies being discussed and offered, an open communication platform is the best way to discuss thoughts and ideas to resolve conflicting ideas and biases, and to positively impact professional learning. The second principle is that diversity of ideas, thoughts and beliefs automatically improve overall organizational performance. The more diverse the methods, practices and actions, the more effective the overall professional learning strategies. The third principle emphasizes leadership effectiveness and focuses on developing leadership skills amongst individuals and teams for collaborative purposes to improve professional learning. The fourth principle dictates that having a clear personal and professional goal makes professional learning more practical and brings about better individualistic results to improve overall organizational performance. The fifth principle suggests that maintaining focus on professional learning in teaching and instruction automatically increases student performance. The sixth principle advises that an evaluation strategy should be in place at the individual level to assess the performance and results of professional learning efforts over time. This provides an objective criterion with which teachers' can assess their skills. The seventh principle highlights the positive effects of collaborative efforts in professional learning and emphasises communication and the eighth principle proposes that collaboration amongst educators improves professional learning and is the most effective way of professional learning (Hirsh & Killion, 2009). Professional learning communities can be established within institutions for the promotion of professional learning and to enhance individual skills set for the benefit of the organization and the individual.

Moon (2007) discusses the impact that reflection has on experiential learning and gives it preference over academic learning. Reflection is an intuitive approach to learning as it encompasses various forms of mental thinking. It allows individuals to think broadly about their field of interest and gives them the ability to critically analyse different pathways to improvement. Reflection is closely related to self-assessment as both have certain similarities when it comes to practicality.

The development of identity within the professional lives of teachers and instructors is the most significant contributor and, therefore, the most constraining factor to educators' inclination towards overall professional learning (McCormack, Gore & Thomas,

2006). The study suggested that a collaborative approach towards professional learning is the most effective way to implement professional learning.

In recent years, professional learning has become more relevant in both theory and practice because of its effectiveness. Stewart (2014), suggests that passive practices are inadequate when it comes to professional learning, and concludes that the most effective strategy towards professional learning, especially when it comes to teachers and instructors is collaboration and the efforts of professional learning communities.

In conclusion, professional development is conventionally a term given to the acquisition of academic certifications that depict some level of competency of the holder in regard to a particular skill. It is formally defined as the practice of a collection of activities that are crucial for the provision of knowledge to students and peers effectively. It is quite common to find emphasis on professional development in almost every organized discipline. The term is almost a synonym for training in service-focused industries. Educational instructors are required to have educational certifications when it comes to improving their skill set. Professional learning is a more collaborative, comprehensive approach to teacher education with emphasis on qualitative assessment, reflection and action. Professional development is frequently given more importance than professional learning as the former is tangible and quantifiable in the form of certificates or any other prove of completion document, however it's the belief of the researcher that professional learning should be considered an important part of professional development and the educational sector should put in place mechanisms to recognize and promote informal professional learning.

2.6 Complexity Theory

In its core, complexity theory puts forward the idea that in a system there are more possibilities than can be realized (Luhmann 1985, as quoted in Cilliers 1998). Despite acting as a seemingly vague addition to this research, this particular philosophy serves as an appropriate reminder of the vast scope which complexity theory offers when applied to various fields of study.

Whether known as 'complexity theory', 'complexity research', 'complexity science', or 'complexity thinking', this prism of thought first saw its emergence in the 1950s and 1960s,

further influencing several generations of researchers in the fields of evolutionary biology, chaos theory, information and communications theory, quantum physics, chemistry, cybernetics, systems theory, mathematics, artificial intelligence, nonlinear dynamics, economics, and management sciences (Cochran-Smith, Ell, Ludlow, Grudnoff & Aitken, 2014, p. 4). More recently, application of complexity theory has led to further development in the fields of anthropology, family research, health, psychology, business, politics, sociology, organizational theory, leadership, and education (Gershenson, 2008)

2.6.1 Core elements of complexity theory

The essence of complexity theory lies in fostering the understanding of and asking deeper questions revolving around the behavior of systems, and how they change, develop, learn and evolve. Instead of centralizing the individual parts of a system in the study of its behavior, complexity theory posits the necessity of expanding the focus of a study as a whole, its relationships, as open systems, and its environment. When considering the behavior of systems through the lens of complexity theory, predictable linear cause-effect relationships are eschewed and given lesser weight than the deeper understanding of multidimensional relationships and the dynamic non-linear interactions between and among agents and elements as ultimately responsible for patterns and phenomena revolving around said systems under study (Cochran-Smith et. al, 2014).

In complexity theory, the lack of stability and equilibrium in intra- and inter-system relationships as well as the relationships between systems and their environment are treated as an inherent part of the study of complex systems, rather than an undesirable state to be excluded or treated as an aberrance. As well, the idea of self-organization and the acknowledgment of bottom-up change processes are critical to the use of complexity theory as a lens.

Most importantly, while complexity theory may not have an agreed-upon definition owing to the various fields of study in which it is applied, and in fact may have several incompatible forms of existence depending on the subject matter, which is exerted as a lens for observation and analysis, it does, nonetheless, hold in common the major ideas and assumptions which unilaterally rejects, regardless of the field of study. These assumptions

fundamentally rejected by complexity theory, when applied by itself to the study of systems, are:

1. The idea that a completely objective and accessible reality exists and is possible to be discovered;
2. Linear models and ideations of cause-effect relationships;
3. Reductionist views of phenomena occurring within systems or between systems and their environment;
4. Positivist research methodologies which aim to reduce complex phenomena to identifiable key factors which can determine outcomes (ibid., p.5).

2.6.2 Complex systems versus complicated systems

Complexity theory is often misunderstood in its practice and application due to fundamental failings in differentiating between complex and complicated systems. When attempting to change one's lens from simple linear cause-effect relationships in systems to complex patterns, the intuitive image which presents itself may not necessarily reflect true complex systems, instead, it may reflect the behavior of complicated systems. This is why understanding the difference between these two terms is critical to any academic study aiming to utilize the lens of complexity theory in their own study and research.

While both complicated and complex systems are made up of multiple functioning parts, each one with its own sets of interactions, complicated systems are those wherein the wholeness of the systems are equal to the sum of their parts. This entails that the functions of such systems and the outcomes of interactions between their various parts may be fully studied and understood by separating the various parts of the system and analyzing their individual functions as well as straightforward roles in the various processes which occur within said system.

By comparison, complex systems, despite having multiple functioning parts they also have nonlinear relationships and interactions affecting the function, process, and output of their various parts, which also engage in intricate feedback loops that constantly affect and evolve the function and output of the system in relation to both its component parts as well as its external environment. In such systems, complexity is inherent at the system level, and

hence taking such systems apart in order to study the relationships between its various components inextricably alters the depth and nuances of the understanding which can be attained in the study of such system's behavior.

Simply putting it, the more one attempts to simplify a complex system in order to understand it better, the less one becomes able to accurately understand any aspect of it and in fact the more erroneous conclusions drawn from such studies of dismantled complex systems become. If one attempts to visualize the differences between a complicated system versus a complex system in order to better understand the contrast - a CD player would be a complicated system, whereas an apt example of a complex system would be the human brain.

2.6.3 Complexity Theory and its role in Education & Professional Learning

Keeping in mind that the primary role of complexity theory as a lens is about reaching a critical mass² among a diverse range of factors, elements, and agents that constitute a particular environment (Mason, 2014. p. 2). We shall now take a brief look into the various possibilities for studies that open up when complexity theory is applied to the fields of education, especially in the case of adult learning.

When an academic researcher considers the emergence and development of education research and study into the phenomenon, process, and execution of education, the first major theory of education which takes precedence is that of Behaviorism. This theory is based on the idea that responses within a learner can be conditioned by an educator along a pre-determined path in order to produce a known and quantifiably predictable output of knowledge and understanding. However, as educational research has continuously developed through the 20th century and the beginning of the 21st century, several other theories have gradually come into existence which slowly expanding upon the nuances inherent in the process of education.

Given that educational research has gradually been moving away from behaviorism - a philosophy which places the greatest emphasis on simple linear cause-effect relationships - towards more complex forms of outlook and lenses capable of better understanding the

² Once a system reaches a certain critical level of complexity, otherwise known as the critical mass, a phase transition takes place which makes possible the emergence of new properties and behaviors and a new direction of self-sustaining momentum which translates in autocatalytic self-sustaining change.

various relationships at play in the process of education, it should come as no surprise that complexity theory has found a deep purchase in the minds of many academic researchers dedicated to the phenomenon of education.

When discussing the framework of complexity theory provided by Morrison and Mason as it applies to the teaching and learning process, Gregory Walker (2014) provides an apt example to highlight why complexity theory fits the field of education research particularly well in order to better understand the various interactions which result in a learner achieving cognition of a subject matter.

A teacher sets a task to be completed by the students because it is believed that it will enable the students to construct an individual understanding of the subject matter. Teachers will be well aware of the information they themselves provided to the students during the activities in the classroom. They may also be aware of the information provided by other sources of knowledge present within their university. However, by no means does the teacher have the knowledge of or control over external and addition resources which their students may have accessed in order to complete their task. Furthermore, they have no agency at this point to whether a student will develop a deep understanding of the subject matter in question, as opposed to a shallow understanding. In this case, while the parameters of the task are set by the teachers largely aware of the limitations to the purview of the topic in question - they have no guarantee of knowledge of the internal path taken by their students in achieving the cognition of the subject matter.

Consequently, it can be surmised that teachers may never fully be able to map the path traversed by their students in order to reach their expertise in a subject, nor can they predict any guarantee of a result from their actions in the classroom (ibid., p. 47). Keeping this in mind, it would be natural for academic researchers to recognize that the phenomenon of education forms a complex system to be studied if its efficacy is to be raised, rather than treat it as a complicated system with several interaction and parts which can be studied in isolation from one another as well.

In essence, while complexity theory eschews the ideation of a completely accurate reality, its application to education research has allowed academics to better understand the

process of teaching and learning as it may practically occur within the complex system of education in which a learner and an educator may act as dynamic components.

Even if complexity theory takes far too many variables into account to be able to reproduce an approach to thought and analysis which may produce repeatable results, it has, nonetheless, allowed educators to increasingly come to terms and recognize an approach to studying their experiences which better matches their personal experiences when engaged with the phenomenon of education. Most importantly, it has allowed researchers to identify behaviors of the teaching and learning system which has allowed the understanding of the complex network of interactions at play in the process of education at least a few paces further, even if the nature of the tool of study used disincentivizes the idea of reproducible factors and variables.

For example, the application of complexity theory to teacher education has allowed researchers to acknowledge that the form espoused by a teacher's own education is determined by societal and statutory parameters, and it shifts over time. Such education programs intersect with individuals, school systems, and family systems, as well as legislative processes and regulatory bodies, and the relationships between such education and the systems in which it is embedded affects how teacher preparation is provided, affecting the teacher's own output.

In essence, while studying the process of teaching and learning wherein both the learner and the educator are part of a complex system. In this sense, complexity theory has enabled the understanding that long before educators become a component within that complex system, they themselves can be considered a complex system. Therefore, they bring to the teaching/learning system their own sets of individualized patterns of interaction with various other networks and their own unique feedback loops, all of which develop further within the teaching/learning complex system in order to produce a unique output.

Just as important, where both the self-identity of a teacher as well as the overall approach to teaching policy is concerned, the application of complexity theory to complex systems of teaching and learning have allowed academics to acknowledge that whatever is perceived to be the currently 'reality' of teaching and learning will cease to be so at some point in the future, as the environment interacting with the complex system will demand

change. This is particularly important because changes and growth in a teacher's perspective on how to play their part within the teaching/learning complex system is a hotly debated topic on the rise at present times.

Even though policies of mass education have allowed the proliferation of grade systems in which an individualized approach to enhancing cognition in learners is not necessarily incentivized beyond the teacher following a 'one-size-fits-all' path to education. Again in this sense, complexity theory has, nonetheless, allowed researchers to better explain the large gap which currently exists between the higher formal education for skilled professionals and their lack of critical analytical tools at the start of their professional lives. Also noticeable when they change jobs and immerse themselves in new complex systems where their output is also affected by transferable cognitive tools previously ingrained in them.

In essence, complexity theory has allowed academics to identify the following behavioral characteristics in a teaching learning system, thus opening several avenues of investigation into input/output in a teaching/learning system beyond the scope of reductionist education theories:

- A. Teacher professional learning itself is an open, non-linear complex system;
- B. Teacher learning is a continuously evolving form of emergent self-organised adaptation;
- C. A complex teaching and learning system are deeply affected by feedforward and feedback interactions within said system, all of which are also affected by initial conditions within the learning experiences of the teacher as an influential agent within said system;
- D. A functioning teaching and learning complex system support both diversity and redundancy, and promotes a healthy challenging of internal schemas;
- E. Within creation and execution of education policy, management as an agent of a functioning complex system recognize the lack of a single, linear, fail-safe approach to professional development or learning (Phelps and Graham, 2012);

2.6.4 Summary and limitations of Complexity Theory

Complexity theory is an increasingly popular lens through which academics endeavor to understand complex educational systems primarily because education as a process eschews reductionist categorization and explanation. It is very difficult to predict the exact output of a system wherein the input depends on the interactions of several agents, each with its own social/political/economic/educational background, holding their own philosophies of thought as paramount while exerting their individual influence over the complex system at large, all the while framed within a system wherein the policies regulating activity may be framed by an entirely distinct and separate sets of agents who bring with themselves the same complexities as the agents actively involved within the complex framework under study.

Though simplified education theories were useful in the 20th century in order to experiment with methods of teaching which might improve the efficacy of the teaching system and paradigm, the erstwhile popular theories have been proving themselves increasingly ineffective in the modern era given the increasing need of transferable cognitive skills over directly transferred knowledge deposits.

However, while complexity theory performs admirably in uncovering the ever-changing practical nuances of a learning system its very fundamental nature also give rise to a wide host of challenges where education policy is concerned. Although, the lessons learned from gleaning into the paradigms of teaching and learning as complex systems may allow for better individualization of the teaching experience - both for the educator during their training, as well as any student agent they interact with from there on out - cementing an understanding of this process as a complex system to be regularized through educational policy has so far been a challenge. So far, no institution as a whole has been able to satisfactorily overcome, even though the academic world has many examples of successful experimental programs to be used as case studies in furthering the application of this lens of thought to educational research.

In summary, the obvious conclusion which can be derived from the application of complexity theory to education and professional learning for teachers remains, while serving as an admirable tool to effect and explain changing needs and practices, essentially a great tool to study and exert constant development - it has as yet not revealed a way to standardize

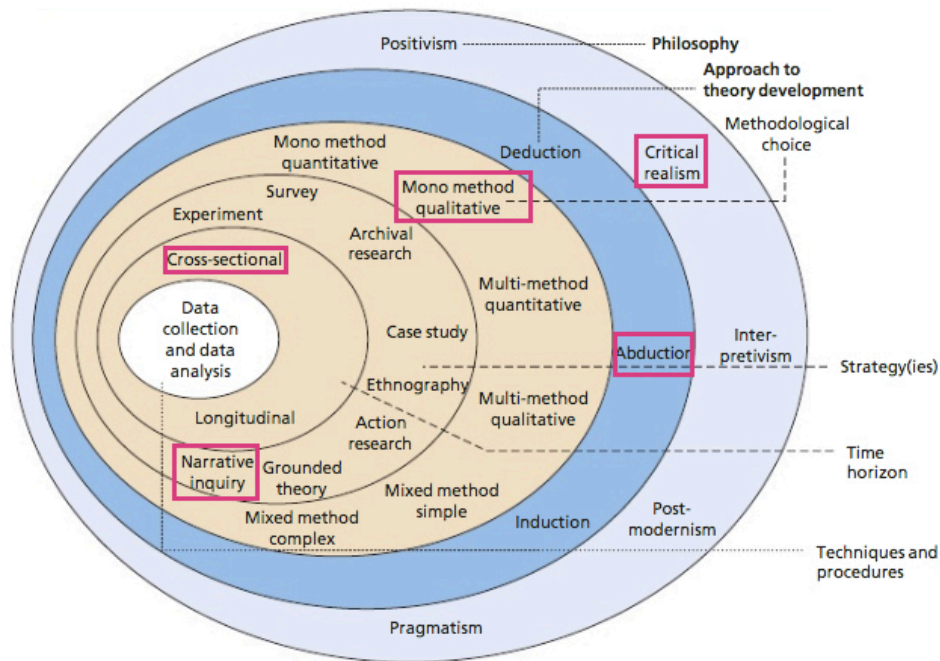
the said changes in a method which would be able to expand individualized exertion of treatment of each teacher/student relationship as a complex input/output system of its own across large number of agents benefiting from the output in terms of cognitive development.

CHAPTER 3 – Methodology

3.1 General Research Design & Rationale

This section provides thorough information about the methodological underpinnings of this dissertation. From the philosophical framework, ontology and epistemology basis, to the data collection and analysis techniques, as elucidated by the research “onion” below:

Figure 7. Research “onion” illustrating this dissertation



Source: 2015 , Philip Lewis and Adrian Thornhill

Every study starts with a philosophical research framework which can be defined as “a system of beliefs and assumptions about the development of knowledge (Saunders, 2015, p.24).

It is important to note that at every stage of any serious study, the researcher makes a number of decisions and assumptions that affect the entirety of the work from choices of research subject and its subsequent design, to interpretation of the findings - assumptions regarding the available knowledge base, a perception of ‘reality’ and the questions arising from that perception regarding events or phenomena to be studied, applicable methods appropriate to test the said questions, all of which are influenced by the researcher’s own set of beliefs and value systems.

An apt analogy to describe this intersection of knowledge and beliefs is cited as below:

When deciding what to cook, there are certain questions to be borne in mind, including: who the meal is for; what food is available; and what cooking utensils and equipment one has. In this sense,, our end product, the meal, depends upon a range of factors over which we have no control (what's available); a range of factors over which we have some control (depending on our personal choice); and a range of belief and preferences that reduce our choices (Dillon & Wals, 2006, p.549).

Thus, the development of a study concerning the exploration of professional learning as part of a complex system - in other words, our 'meal', in which issues of power and rhetorical peculiarities play a role in the emerging context needs to clearly establish its ontological perceptions and epistemological stances in order to develop appropriate research paradigms and methods for data gathering, analysis and interpretation (Bracken, 2010).

Among these, ontological perspectives examine what we are dealing with "(the what - the nature of reality)", epistemology refers to the methods we use, or "how we make knowledge (the how)", and axiology refers to "ethical considerations and our own philosophical viewpoints (the why)" (Dillon & Wals, 2006, p.550).

Practical implications arise through a deeper awareness of the ontological substructures informing their studies. Researchers find themselves better positioned to interactively reflect upon and define the best ways to engage in their research projects. An understanding of the epistemology of the undertaken study then informs the researcher as well as others, about the philosophy underlining the method of approach to data and its analysis, the scope of the methodological philosophy in its ability to reveal accurate, non-generalized inferences, and its limitations. Axiology plays an indubitably important part in outlining the motives of the researcher. No decisions can be made in the absence of a value system. From its very nature, when a researcher decides to undertake one line of study over another, that agency of choice exercised by the researcher is informed in turn, by their value system assigning greater merit to the chosen subject matter over the other, equally available, aside from pressing questions. Axiology helps to inform other researchers seeking to either

replicate a study or continue delving into any given subject matter of the value systems espoused within the working philosophies of a study by its researcher.

3.1.1 Research Philosophy

This thesis's philosophical foundations are grounded in critical realism. This philosophy considers that although reality is not fixed nor immediately accessible, there are some aspects of reality that exist beyond the knowledge or conceptions we have of them; one key aspect of reality is the causal mechanisms that produce empirically observable events (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014, p.15).

From a theoretical perspective, this study sees professional learning as part of a complex system, and reality as being non-linear and adaptable to changes created by the interactions between the individual and the environment meaning people such as the different members of the organization, and contextual factors such as the workplace structure and characteristics.

Studying professional learning through the critical realism philosophy means that one focus of the thesis lies on explaining what we see and experience, in terms of the underlying structures of reality that shape observable events (Saunders, Lewis, Thornhill, & Bristow, 2015, p.138)

3.1.1.1 Critical Realism.

At its philosophical roots, the underpinnings of this thesis are grounded in the realm of critical realism. While the philosophy itself is difficult to pin down in absolute terms, having been expounded upon and debated in discourse rather heavily since its initial conceptualization by Roy Bhaskar, the tenets of this philosophy can be understood through its 'haves and have nots'. In order to find their philosophical perspective on a subject, critical realists combine 'ontological realism', 'epistemological relativism', and 'judgmental rationality'.

Table 4. Critical realism

Ontology	Epistemology	Axiology	Typical Methods
Critical Realism			
Stratified/layered (the empirical, the actual and the real) External, independent, Intransient Objective structures Causal mechanisms	Epistemological relativism Knowledge historically situated and transient Facts are social constructions Historical causal explanation as contribution	Value-laden research Researcher acknowledges bias by world views, cultural experience and upbringing Research tries to minimize bias and errors Researcher is as objective as possible	Retroductive, in-depth historically situated analysis of pre-existing structures and emerging agency. Range of methods and data types to fit subject matter

Source: 2015 Mark Saunders, Philip Lewis and Adrian Thornhill

“Ontology logically precedes epistemology which logically precedes methodology”
(Hay, as cited in Grix, 2002, p.178).

[Ontological realism] implies that there exists a reality which is stratified, differentiated, structured, and changing. [Epistemological relativism] tells us that our knowledge about this reality is always fallible but, as [judgmental rationality] suggests, there are some theoretical and methodological tools we can use in order to discriminate among theories regarding their ability to inform us about external reality (Danermark et al., as cited in Cochran-Smith et al., 2014, p.109).

As pointed out by Maxwell, critical realists shun the perspective of ‘naïve realism’ which dictates that our perception of reality directly represents its objective nature, while also rejecting radical postmodernist perspectives that hold to the belief that reality does not exist apart from our perceptions and constructions of it (as cited in *ibid.*).

In doing so, while critical realism holds that there exists a reality independent of human consciousness, that reality is neither fixed nor empirically accessible. Instead, critical realists approach the world as being layered or stratified into different domains of reality.

A directly observable pattern of behaviour (the empirical domain) can be explained in a closed experimental setting by investigating linear causal relationships between different variables (the actual domain). Quantitative researchers frequently operate in this domain. However, we might also wish to know something about how this pattern of behaviour is produced by a causal power, or causal mechanism, not immediately

apparent at the level of appearances and which can only be fully explored in open systems (the real domain) (Bhaskar, as cited in Roberts, 2014, p.3).

Critical realism thus, adopts a more qualitative approach to studying causal relationships and rejects the idea that empiricist knowledge borne by quantitative methods is an accurate representation of the complexities of reality, insofar as the structure of reality can be accessed and understood. Instead, it espouses an approach wherein causal links may not be generalized, simplified, or in any way be stripped down of their participant components, so that the tangled nature of feedback loops in any given system under study may remain intact - and thus may present a rather 'rich' and meaningful understanding of that system in practical terms. Furthermore, critical realism embraces the possibility that any knowledge generated may be fallible, since the complexity of the world and its underpinning social systems may lead to wrong or misleading inferences, and so affirms that the job of social investigators is to keep studying causal mechanisms and their relationship in different research contexts (Benton and Craib, as cited in Roberts, 2014).

3.1.1.2 Epistemology.

Epistemology is the philosophical aspect of the research dealing with the theory of knowledge. Specifically, it applies itself to the methods and "possible ways of gaining knowledge of social reality, whatever it is understood to be. In short, claims about how what is assumed to exist can be known" (Blaikie, as cited in Grix, 2002, p.177). If ontology informs the nature of reality accepted within a study - in other terms, what a researcher thinks can be studied within reality, insofar as an understanding of reality can be constructed - and methodology informs the researcher on how to go about acquiring the information needed for that study, epistemology dictates the researcher's thoughts on what can possibly be known even through study of a particular aspect of reality. In the case of this study, the epistemological philosophy of the research undertaken is Epistemological Relativism informed by complexity theory.

Epistemic relativism is the position that knowledge is valid only relatively to a specific context, society, culture or individual. The discussion about epistemic

relativism is one of the most fundamental discussions in epistemology concerning our understanding of notions such as 'justification' and 'good reason'. (Seidel 2011)

3.1.1.3 Axiology.

No social system can truly exist without values and systems of belief affecting it rather significantly at the individual level. In the words of Hill, there are no value-free sociologies (1984, p.66). So, too can no study of social systems be undertaken without the researcher's own experiences and personal philosophy affecting a plethora of decisions from the choice of subject matter to the treatment of the sample participants. Hill upholds the belief that not all knowledge-producing systems are equally suited for every manner of social research and that responsible axiological allegiance demands that researchers seek axiologically-compatible knowledge producing systems suited to the goals of their project as well as demonstrate through their analysis and study that the project embodies the highest axiological principles (ibid., p.67). Thus, in this segment, I hope to not only outline my own driving motives behind this study, but also the axiological compatibility of my chosen epistemological philosophy.

In my case, having had professional experiences where non-linear barriers to information arising from the socio-economic context related to my workplace informing the actions of other key actors involved in the space of my organizational learning - I feel I understand some aspects of the non-objective nature of the various individual components of learning systems quite intimately. As such, it has long been part of my personal belief that every aspect of a learning system - whether through formal and non-formal education, knowledge-sharing within an organization, development of skill through communities of practice, or other informal activities - is informed and affected by how an individual within that system reflects upon, processes and internalizes information.

Using a critical realistic approach through the lens of complexity theory on one hand came quite naturally to me when I needed to ascertain my philosophical standpoint on study of learning systems through the lens of social sciences. Primarily, critical realism as a philosophical construct was intended to be used to not just study social systems and their

intricacies, but also to provide a critique on the various ideas upholding the numerous systems that create our society (Cochran-Smith et al. 2014, p.110).

Examining the efficacy or otherwise of learning systems in the absence of personal beliefs and motives driving various actors leads to an ‘ideal’ understanding of systems, but not a ‘real’ or practical one. As affirmed by Byrne, and Reed and Harvey, approaching critical realism through the lens of complexity theory provides a unique advantage to a researcher - it allows for “a way to relate macro and micro issues without being reductionist and a way to describe the agency-structure relationship that accounts for human agency by acknowledging that human beings may have the capacity to initiate certain causal sequences” (ibid., p.111).

This attempt to merge my personal philosophy with the research framework was also why I chose to use interviews as a method of data collection from my sample participants. As Berg (1989) puts it, qualitative interviews can be described as a conversation with a purpose (p.13). Such a technique would allow participants to open up and talk more freely around emotional topics, allowing greater insight into how people felt and thought about their systems outside of objective facts about their experience.

Finally, approaching the methodology in this study in such a fashion as to be able to study relationships and non-linear causal links was not just a decision taken out of my wish to also gauge the impact of various social dynamics and inequalities affecting the output of this complex system of learning. It also allowed me to standardize and compare data affecting systems of learning in otherwise incomparable careers.

3.1.2 Research approach

Abduction is the major research approach used in this dissertation. A major limitation in the philosophical approach underpinning this study is that any existing body of work in this field which may have dealt with similar subject matter have rarely, if ever, done so through the lens of complexity theory. While critical realism and complexity theory are both quite intellectually complementary to the study of a system with as many moving parts as organizational learning - most existing work revolving around it has usually been framed around specific case studies applicable to highly localized contexts. Since the purpose of this study on the other hand is to uncover causal links which may be tested and applied across

professions - a different approach to research and analysis was required outside the usual methods of induction and deduction utilized in the field of qualitative analysis.

To that end, this researcher chose retroduction, or abduction, as the means to approach the research data and analytical exercises. This process has been lauded by subsets of the research community as a knowledge-extending means of inferencing, categorically distinct from the normal types of logical conclusion listed in the previous paragraph (Peirce, as cited in Reichertz, 2004). However, in order to understand the approach of abduction, it becomes necessary to understand deduction and qualitative induction.

Deduction in an intellectual process wherein the data analysis starts from a previously known rule generally considered as fact. The analysis then moves from this acceptance of the general rule as fact to finding the contexts supporting this rule in the data. As such, it starts by accepting a known inference, then looks for the markers supporting that inference within the data of an individual case. If the markers for said context are visible in the case, then that case is believed to fit the general rule initially accepted as fact.

Whereas deduction looks for specific data out of the total within a singular case to make it fit to a rule, qualitative induction on the other hand opts to supplement visible properties of a case under study with additional features which haven't been perceived in order to make it fit a larger totality. In this sense, qualitative induction operates in generalizations. As Reichertz puts it, qualitative induction is the basis of all scientific procedures that find, in collected data, only new versions of what is already known (*ibid.*, p.304).

Abduction is an analytical process where the method consists of assembling or discovering - through means of analyzing the data - such a set of characteristics or phenomena actively influential upon a given case for which no known explanation or understanding exists. In such a discovery, a new process of thought, explanation, or rule must then be invented by the researcher which may make sense of such a combination of characteristics and inter-related phenomena - an intellectual effort in order to explain sets of factors or variables which have never before been linked to one another in such a fashion, giving rise to a new understanding of the data under study. Thus, this is a process by which useful explanations may be conceptualized through examining data in ways others may have not

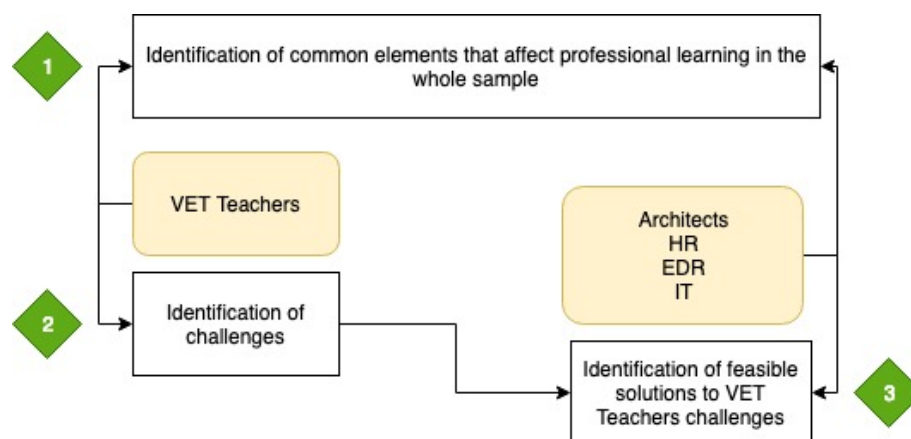
yet done, to generate knowledge in directions others may have not considered. As Bateson (2002) elucidated, all thought would be totally impossible in a universe in which abduction was not expectable (as cited in Richardson & Kramer, 2006, p.500).

More specifically, since critical realism propounds all accepted knowledge as fallible and propagates the study of causal mechanisms in hitherto unexplored fashion as a method of gaining some insight into the structure of reality in the real domain, abduction is an accepted forerunner for analysis performed by critical realists.

3.2 Research plan

The diagram below represents the layers of analysis entrenched within this study:

Figure 8. Data collection plan



Source: Researcher

3.2.1 Research context

To clarify, this study does not revolve around the intersection between formal, informal, and non-formal education which may occur along the path of professional progression and career development of an individual. Specifically, this study is designed to gauge the working of systems and practices couched under the umbrella term 'workplace learning'. It addresses the accruing of knowledge or development of a skill-set which either may have already been relevant or was previously considered unrelated to the specific jobs or career paths undertaken by professionals - either necessitated by a change in career paths because of a natural progression of their trajectory over to other fields through the individuals exerting their own agency, or necessitated by large-scale economic trends, or necessitated by

changing demands and expectations placed upon these professionals by their organizations - during the course of these individuals carrying out their professional responsibilities. With goals such as “socialisation in a profession, transferability (as a cognitive acquisition principle) and mobility (in the European labor market...)” (Nijhof & Nieuwenhuis, 2008, p.4) as high on the current professional agenda as they are - research into the causal mechanisms and feedback loops affecting the experience and efficacy of organizational learning systems as well as insights which may then be applied to the teaching profession is vital to improving the knowledge acquisition and skill development trajectory of contemporary as well as future professionals in the European marketplace.

The image adapted in Figure 2 serves well in its objective to help visualize the three levels of analysis which the researcher aims to study in this thesis. The primary goal of this research is to study the operation of a workplace learning system, when informed and exerted upon by the socio-economic context of its operational marketplace, and how this complex system both affects and is affected by the actions of the individual and associated communities of practice and learning within the workplace in their efforts to master new tasks and skills.

Within the parameters of this study, the socio-economic context refers to large-scale effects, movements, emerging patterns of social thought and identity, economic booms or declines, or any other real-world trends which may either have an effect on the professional nature, output, or input of work undertaken by an organizational system, or which may have an impact on the systems of identification or feedback loops which govern social identities, hierarchies, and networks surrounding an individual or groups of participants within communities of practice or other avenues of knowledge sharing and skill development in said organization.

3.2.2 Research questions

This study has one main research questions that will draw on knowledge from social and educational science and professional learning theory and will be examined through field data analysis.

Questions

1. What perceived innovations exist in the different professions that could be applied to the teaching profession?
 - 1.1 What challenges exist on the Vocational Education and Training (VET) teaching daily practice?
 - 1.2 What kind of solutions exist in other professions to answer to these challenges?
 - 1.3 How can such processes become adequate in order to be adapted as innovations to the teaching profession?

Further clarification into the context of this research may be achieved by sharing this information from the primary data collected during the course of this study. One participant from the sample group, an architect, shared his/her experiences during an economic decline. At the time, experienced professionals along the organizational hierarchy as well as peers from this person's working group grew increasingly reluctant to share knowledge or aid with other colleagues in skill-building as by doing so it could pose a threat professionally by knowledge or skill bearing actors within the organizational learning system. When such an effect is exerted upon a learning system by socio-economic factors, the generalization of causal mechanisms and their effects described above is one of many within a real-world organizational context.

It is precisely to ascertain the non-linear causal mechanisms among unique organizational systems as well as the effect on their nature by the characteristics of individuals and groups participating within them, which may lead to such a plethora of responses at an individual or systemic level, that this study has been undertaken. By uncovering a broader understanding of causal mechanisms which may either promote or create barriers to innovation in organizational learning systems through the lens of social research, the researcher aims to provide more avenues of exploration which might improve future best practices and foundational principles of teaching outside of established pedagogies.

3.2.3 Participant Sampling Criteria & Recruitment

The participants in this study were highly skilled professionals, whose work involved knowledge creation, as well as symbolic-analytical activities (Margaryan, Milligan and Littlejohn, 2013, p.1). The sample was drawn from five different key industries: Architects (A), Educational researchers (EDR), Vocational Education and Training (VET) teaching, information technology engineers (IT), Human Resources (HR). These industries were selected as a representative survey of the primary professional groups, as defined by the International Standard Classification of Occupations (ISCO 8).

Critically, each of the above outlined industries (and their associated professions) are all classified as level 4, as assessed by the standards of ISCO 8. Distinctively, occupations rated as level 4 require some nature of higher education qualifications, and demand complex problem-solving skills. Furthermore, a level 4 occupation must necessarily also feature tasks related to decision making and creativity, both of which need to be based on theoretical and factual knowledge (ILO, 2007, p.13). Finally, as previously stated, knowledge creation and symbolic-analytical activities are also involved in a level 4 classification (Margaryan, Milligan and Littlejohn, 2013, p.1). Given the complex characteristics and tasks connected with level 4 professions, it is fair to assume that these occupations could provide fruitful elements of analysis. Such elements could include involvement in communities of practice, higher levels of reflection, as well as leadership opportunities at the managerial level.

The complete criteria for participants selection are stated below:

1. International Standard Classification of Occupations (ISCO 8)
2. Hard and soft sciences classification (Postareff, 2007).
3. Signature pedagogies (Shulman, 2005)
4. Appropriateness to the study
5. At least two years of experience in the work they are performing
6. Accessibility and convenience

It's important to note that while the study sample was drawn from European countries, both EU and non-EU nationals working within European nations were considered for participation in this study, in order to preserve fidelity with the nature of contemporary real-world complex organizational systems. For instance, this study mainly took place in

Hungary, but the participants are professionals residing also in other EU countries (i.e. Czech Republic, Slovakia, etc.) The participants were recruited through the snowball sampling method, initially through the recruitment of individuals as sample participants in the pilot study as outlined in the next segment. Also known as chain referral sampling, this approach to recruitment is self-propagating to an extent, since future participants are referred to the researcher by current and past participants. This method of recruitment was uniquely well-suited to the needs of this study.

As Noy found, snowball sampling relied on and engaged in the dynamics of natural and social organic networks (2008, p.329). Prior research in other ‘hypercompetitive’ environments involving professionals exhibiting high levels of technical expertise and knowledge production has already borne out results confirming that social networks play a significant role in knowledge sharing ~~both~~ at an intra-system level as well as between distinctly separate organizational systems. This is because social networks eradicate a great deal of uncertainty regarding the accuracy of knowledge imparted, since the credibility of the individual(s) imparting the skills and/or knowledge to others in the system or community of practice is already established within the recipient group. Moreover, shared norms among individuals or communities within a social network provide sufficient levels of trust to ensure that the outcomes of knowledge and skill sharing will be fair with respect to all parties involved within that system of learning (Liebeskind, Oliver, Zucker & Brewer, 1994).

Keeping the importance of such interactions between social networks and organizational learning in mind, snowball sampling was selected by the researcher as the chosen method of recruitment since the purpose of the thesis was to explore the unique nuances and non-linear causal mechanisms that affected the learning experiences of individuals within a complex system and well as their contributions to the output of the system as whole.

Table 5. Demographic information of the sample

Table 5. Demographic information of the sample	
Females	10
Males	15
Nationalities	9 Brazil, Bhutan, Czech Republic, Hungary, The Netherlands, Serbia, Slovakia, Peru, Poland
Participant countries	3 Austria, Czech Republic, Hungary
Minimum years of experience	3
Maximum years of experience	40
Median years of experience	9
Minimum number of jobs in the field	1
Maximum number of jobs in the field	18* ³

Source: Researcher

3.3 Pilot Study

The pilot study conducted by the doctoral candidate revolved around the barriers to execution of professional duties and expectations faced by Human Resources (HR) professionals during the course of their daily discharge of duties. It demonstrated to the PhD candidate the irrefutable need for a better understanding of the complex structure of a learning environment in its entirety for any professional - insofar as such a structure can be broken down into its component layers, and the contribution of each component to the whole as well as the interaction of all components with each other can be studied.

This would directly inspire the researcher's goals in this thesis to further the existing knowledge base on the factor affecting how a professional learns during the course of their job. Moreover, the results of the pilot study irrevocably demonstrated to the candidate that a vast majority of the HR professionals interviewed during the course of the said study felt drastically unprepared to deal with the realities of the expectations and professional burdens laid upon them during the course of their work. One of the root causes of such problems may, then lie in the execution of their higher education as well as the pedagogies to which their teachers may have found themselves far too attuned to realistically produce students who may be prepared for the realities of the shifting nature of the present workplace.

Since the contemporary economic scenario demands hybrid work-spaces, wherein executives in the HR industry may have originated from academic or professional backgrounds not specifically tailored to developing relevant skill-sets for the said industry -

³ Including freelancing jobs in certain careers

the study sought to deepen current understanding into the phenomenon of ‘boundary crossing’, and the methods of acquisition of knowledge by which HR professionals - who may or may not necessarily have higher education portfolios directly relevant to this field - engaged in skill-building in order to execute their assigned duties.

In this context, boundaries were defined as socio-cultural differences that inhibit action and interaction between members of different backgrounds, disciplines and, in this case, professions (Akkerman & Baker, 2011). As explained by Engestrom et al (1995), boundary crossing could be understood as the practice of “negotiating and combining ingredients from different contexts to achieve hybrid situations” (p. 319). This process can refer to interactions between people, objects and different practices (Akkerman & Baker, 2011, p.1).

The study considered a hybrid state as the new normal of the HR industry, with few existing formal education programs which may objectively or practically prepare their graduates in most, if not all, skills vital to the execution of their expected roles in a professional organization. In order to study this phenomenon within the constraints of its practical limitations, the study first reviewed existing literature on the field to outline not only the changing nature of the contemporary workplace - wherein professionals may need to switch occupational categories, regardless of their original field of training, based on necessity, availability of job prospects, etc., but also the fact that the role of an HR executive in itself is one which is expected to innovate and establish new processes and techniques for resolution of challenges faced by an organization in the business context.

The research questions guiding the studies were two-fold:

1. How do HR professionals perceive the extent to which they are prepared to be competent in their positions?
2. How do HR Professionals deal with the challenges in their positions?

In order to answer the questions guiding the study, the researcher interviewed 12 HR professionals from small, middle-size, and large-scale companies based in Hungary and Slovakia. The participants included in the study were recruited using snowball sampling, a non-probability sampling method employed when the variable characteristics required within sample participants are difficult to define before the data itself can be collected and analyzed.

The HR professionals were contacted through information provided by their respective organizations, which had in turn been approached by the researcher at the start of the sample recruitment process. The final participants were HR employees with non-leadership positions working in senior management at junior, middle and senior levels, with experience in the industry ranging from one to ten years. Only one interviewee held an experience of more than 10 years in the field. The participants were between 22 to 41 years of age, with a mean of 27.33 years. Five participants were men and seven were women. The participants varied in their educational backgrounds, with one third of the whole sample holding formal qualifications in the HR area.

The data was collected through 40-minute interviews, either in person or through virtual communication platforms, and were conducted through the use of a series of standard questions. The topics of the interview were structured around the research questions, and were focused on four overarching themes:

1. Circumstances that promote or inhibit professional learning (e.g., What type of support did you get in order to start working?);
2. Role of the communities of practice on individual professional learning (e.g., In what circumstances did you feel welcomed whenever you asked for help?);
3. The role of the workplace in the relationship between the individual and the Community of Practice (e.g., Does the workplace provide learning opportunities?);
4. The role of the individual professional learning in the communities of practice (e.g., What ideas did you propose to the team that were later used?).

The analysis of the data revealed that informal learning, on-the-job training, and applied experience in the fields were considered the best teaching methods by many of the interviewees in terms of building skills necessary for them to be able to face their professional challenges and the expectations laid on them. Even in cases where participants had pursued further formal education avenues as a means of improving their skills, after initially having experienced their lack of preparation upon the start of their professional careers - further studies in a formal context yet again failed to resolve the most pressing issues. This hinted towards an inescapable inference. Specific knowledge imparted by systems of pedagogy can

hardly find itself sufficient today, when the basic nature of a profession demands an adaptability to constant change.

In an age when the ability to innovate and pivot one's area of focus are the paramount demands placed upon a professional by their organization, graduates from formal training were starting their careers limited by the specific knowledge bestowed upon them by their systems of pedagogy, rather than having been trained in methods of approach towards complex problem-solving supplemented by sufficient practical training aimed at developing skill sets which may be applicable to the professional experience as a whole. Within this pilot study, those aforementioned lacking skill sets were revealed to be as foundational to a professional experience as basic communication and 'people' skills.

The lessons from the pilot study ultimately inspired the need to further understand the innovations in learning which working professionals and their organizations demonstrate towards achieving professional capability. Not only this but also the need to extrapolate techniques and processes which may be applied to the teaching profession.

3.4 Nature of Data & Collection Methods For Thesis

3.4.1 Primary data as semi-structured interviews. Interviews are widely used in social sciences since they provide means of gathering information having a direct bearing on the research objectives, test hypotheses or suggest new ones, or as an explanatory device to help identify variables and relationships, and even to follow up unexpected results (Kerlinger, 1970 as cited in Cohen, Manion and Francis, 2007, p. 351).

As discussed in section 3.1.13, interviews were also identified as the best approach to collection of primary data by the researcher since they allowed for discussion of variables and non-linear causal relationships and interactions that would have otherwise been difficult for participants to discuss in a heavily structured environment. Such method allowed the researcher to actively pivot conversations towards topics which may have seemed tangential to the participants, but which may have been integral to one or more queries guiding this study.

3.4.2 Data collection protocol. The interviews took place mostly in a face-to-face manner. The researcher made sure that the interviewee was aware of the content of the

consent form before starting the interview. Most consent forms were signed before starting the interview. When this was not possible, a verbal consent was required by the researcher, followed by the correspondent consent form. This happened only when personal meetings were not possible. Under logistic constraints not allowing personal meetings to take place, virtual interviews (skype, hangouts, etc.) were organized following a similar protocol to the personal interviews; telephone interviews were also considered. In case it was not possible to set a personal meeting by any of the means described above, a written interview was proposed.

3.4.3 Tools. A voice recorder was used in this study. Whenever an interviewee would not agree to be recorded, written notes replaced the voice recorder. All the transcripts and notes will be kept for five years after the conclusion of this research. In addition, the other major tools utilized for data acquisition in this study were the consent form and questionnaire. See Appendix 2 and 3

3.4.4 Data storage

All documentation containing information about the participants, including consent forms, have been kept in a safe place chosen by the research team and no copies of the data have been made, nor are to be made in the future as per the terms of consent acquired from the participants. This documentation will be safely stored for at least five years after the conclusion of the project.

3.5 Data Analysis Plan

3.5.1 General Procedure for Content Analysis

In this study, interviews of 25 individuals from five professions have been analyzed. The selection of more than one profession gave the researcher the opportunity to delineate the variation of elements and circumstances enabling professional learning within different professions.

The interview transcriptions were initially analyzed using the “inductive content analysis” approach, following these outlined steps: data reduction, grouping and conceptualization of data (Patton, 1990; Postareff, 2007; Flick, 2014).

Following the standard protocols of qualitative content analysis using induction to conceptualize generalizations about the interactions between the participants and their organizational learning systems, the principles of abductive reasoning were then applied to test whether the additional contextual details uncovered through the interviews - in conjunction with the inductive generalizations - could uncover any hypothetical causal relationships which would provide additional avenues for exploration and studies in future research. The generalizations uncovered through inductive reasoning, in turn, would not just serve as a jumping-off point from which abductive hypotheses could be conceptualized and tested, but also as a means to uncover innovations or practices which could then be integrated into the field of teaching.

3.5.2 Steps in Analysis

3.5.2.1 Transcription. As assured to the participants in the consent form and questionnaire (outlined in section 3.2.4.3.1), the first step undertaken by the researcher was to create transcriptions of all audio recorded at the time of the interviews. The interviews were typed into text format, and the recordings were destroyed in order to uphold the terms of participation in the afore mentioned form. In case of the interviews where no such recordings existed, the textual information - either written by the researcher during the course of face-to-face interviews, or through digital communication platforms, or provided to the researcher as answered questionnaires - was transcribed into a consistent format so as to regularize the process of coding across all data input.

3.5.2.2 Coding. In this study, coding of the transcripts to recognize and compile thematic categories was performed primarily by the researcher. A primary manual coding of the data was performed by the researcher in order to familiarize themselves with the primary information available at hand. A secondary coding set was, then generated through the use of NVivo qualitative analysis software. This tool provided a computerized, and hence objective, breakdown of the data into thematic sets and sub-sets, thus avoiding the subjectivity of the researcher from influencing the output of this stage of data analysis. By running the primary data through multiple queries on this tool, this tool allowed the researcher to gain a clear understanding of emergent thematic categories through groupings of similar word usages in responses. Where needed, the researcher added contextual primary

data gathered during the interviews as memos to the thematic categorizations done by the tool in order to ensure that the nuanced relationships being developed through the textual breakdown were as insightful as the data allowed.

An additional coder was also employed to code a subset of the total data sample in isolation from the PhD candidate in order to provide another of objective verification of the coding undertaken by the researcher. The secondary coder's work was then utilized to evaluate Cohen's Kappa - the value for agreement between raters of data - in order to ascertain the utility and scientific value of the collected information with respect to their integrity and ability to answer the research questions guiding this study.

Table 6. Example of initial coding framework

Table 5. An example of an initial coding framework	
Interview transcript	Initial coding framework
Interviewer: What do you mean by working culture and environment ?	
Professional: The company culture is decisive. That is responsible for the quality of the colleagues and for the motivation. Whether you can identify yourself with the team, the project and the company.	Open culture Institutional Knowledge sharing
-So (from my last job) this is a big difference because before I knew there was knowledge that I cannot reach anywhere and I needed to ask. And I didn't know what (type of) knowledge and where is not. Here I know that everything is shared, everything is somewhere published so I can just access it... So it's always a very equal (knowledge sharing) position for everyone.	
Interviewer: What about the environment?	
Professional: I get accepted by the colleagues, which is the key for efficient co-working.... Whether you can identify yourself with the team, the project and the company	Social recognition Relationships

-to share your IT skills is important, that your colleagues accept you and appreciate you as an expert
 -The personal qualities of the colleagues and your good relation to them.

Source: Researcher

3.5.2.3 Objective verification for categorization. In order to provide an objective verification of the various categories coded - thematic headers, sub-headers, and constituent points of focus - the interview analysis and categorization was further inspected by both supervisors of the thesis, as well as critical colleagues, and the categorizations were corrected and revised to the extent that it was deemed necessary at the end of the process.

Table 7. Example of final coding framework after reduction of categories in the initial coding framework

Table 6. An example of final coding framework after reduction of categories in the initial coding framework	
Final coding framework	Initial coding framework
1. Knowledge sharing	
Attractors	Open culture Open communication Positive feedback Social recognition Relationships Technical experience Self-confidence
Hindrances	Time Lack of records Power-distance Social features Uncovered knowledge Isolation Confidentiality Lack of freedom Bureaucracy

Source: Researcher

3.5.2.4 Thematic analysis. Once the open coding, secondary coding, and objective verification of categorization was concluded, the researcher then proceeded to compile and analyze the available data to answer the four major queries referenced in section 3.2.1.

Since this particular subject matter does not have an existing body of research which could satisfy the lens of complexity theory, inductive processes were initially used to break down the data into component thematic categories. However, from this point onwards, both inductive and abductive processes were used to analyze the data. The generalized inferences available through inductive processes served to provide an overview into the individual participant's relationship with their organizational learning systems. From there on, abductive processes were used by testing theories through the Mind Map tool of NVivo to test various hypotheses concerning hitherto unexplored non-linear causal relationships as hinted at by the data sets in their minutiae

CHAPTER 4 – Results

As indicated at the beginning of this dissertation, the aim of this work is to identify practices from four different professions that could benefit the teaching profession. To achieve this goal, a main question and three sub-questions were developed. The main research question is:

What perceived innovations exist in the different professions that could be applied to the teaching profession?

The strategy to answer the main research question was to develop sub-questions. *Sub-question 1*. What challenges exist on the VET daily practice? This sub-question intended to gather information about distinct challenges, problems and obstacles that teachers may encounter in their daily practice. Challenges regarding the lack of financial support in the workplace were partly excluded from the results. *Sub-question 2*: What kind of solutions exist in other professions which may be helpful in answering these challenges? This sub-question intended to find possible solutions for the different challenges expressed by teachers in other professions. *Sub-question 3*. How can these innovations be adapted to the VET teaching profession? This is perhaps the most interesting sub-question since it deals with the possible implementation of what is believed to be viable solutions that can be applied to the profession of teaching stemming from other professions. This sub question takes into consideration several aspects of the teaching profession and other professions in order to make the alternatives feasible.

1.1 What challenges exist on the VET daily practice?

In order to find the challenges present in the VET teaching practice, a coding process of the five interviews was done. Some challenges related to the financial means of the workplace arise, also challenges related to peer collaboration and leadership were the most pressing ones. However, the main challenge found in the vocational education and training profession is:

VET 1. Lack of preparation from the leader to guide and to delegate

1.2 What kind of solutions exist in other professions to answer to these challenges?

In order to identify plausible solutions for the challenges existing in the profession of teaching, an analysis of how the learning process takes place in the different professions was done. See Appendix 1 to appreciate an example. The following professional approaches to learning were identified:

Architecture (ARC)

In the Architecture profession three main characteristics were identified:

A1. The Mediating role of the project manager between the employee and working knowledge needed to perform work related activities

Although the Architecture profession has a horizontal structure of the community in which communication was open, the interviewees expressed that they had the chief architect or boss as their main source of knowledge. It is important to note that architects share their leadership so the lead architect in one project may, not be the leader in a future project.

I would say that the boss was a, like a master or a mentor and for because of this it wasn't, uh, wasn't so stressful (Isidro)

At the first year I had a staff member, the, a guy who was my boss, but uh, he was not the "boss like" person. So he was a nice person. And we worked in an open office system (Agnieszka)

Horizontal structure:

...most of the places where I was working were the horizontal type of organization so it wasn't that rigid in terms of you can just go to anybody and ask whatever you want. Also may be related to the size of these companies because architectures offices are usually smaller. Everybody knows everybody and you don't need to do with this big walk around to get to. So you can just go directly to the person thing, might know what you want to know. (Baldemar)

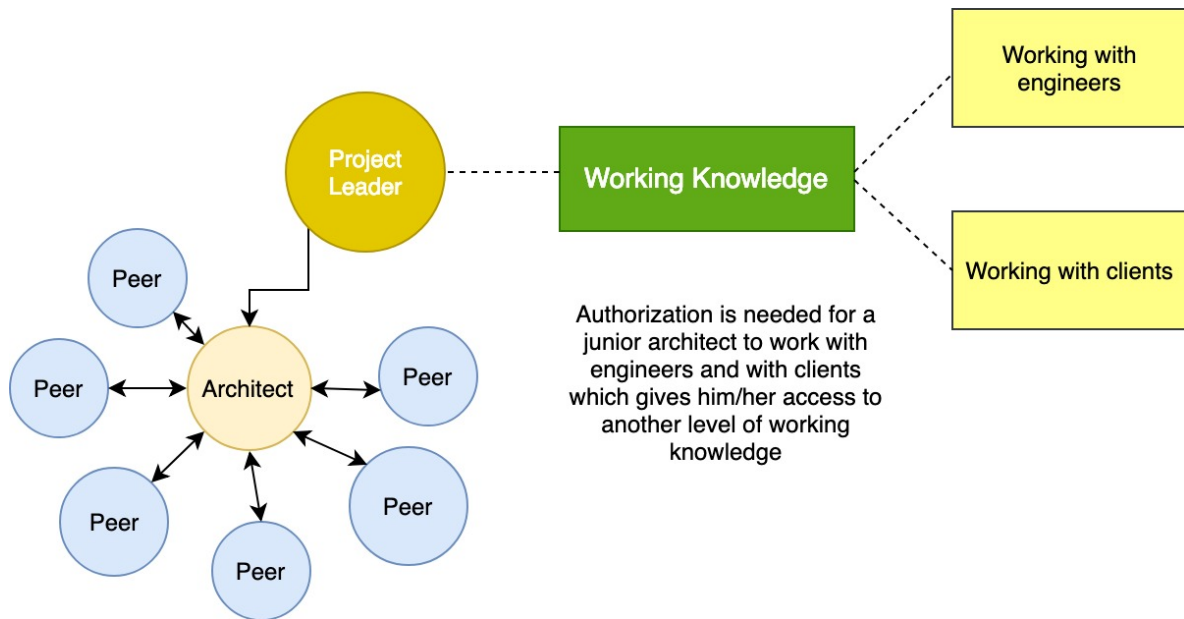
we are so that their office really have two bosses and we are four more, so it's a small office. We are six together and uh, and the hierarchy is not so strict because we are working together and everybody can say what he wants to say and everybody can ask what he want to ask (Isidro)

A2. Cooperating and learning from other professionals that work in the same project

This point is particularly interesting since architects are aware of the importance of cooperating with other professionals, for instance, they openly look for the opportunity to work with them and learn from them, however, it is important to note that this opportunity is mainly open for senior architects. Also, the level of communication between an architect and an engineer working in the same project depends in several cases on the architect in chief who, may very well obstruct the communication

Yeah. I really liked the group of engineers who we are working with but it's sort of the same as the relationship with the client. So for now most of the project leader or the boss controls this sort of relationship. So sometimes let's say, I can sit into a meeting, then we are meeting the electrical engineer but I'm not like directly in touch with them like organizing, but now it feels like they are very, very helpful and they always think about the problem and how to solve it. Not just about what didn't work. They would say okay, this didn't work but, you can do this, this and this in order to make it better... I would like to learn from them this sort of knowledge about the building constructions like how to make the building waterproof or water tight and this sort of like technical knowledge of like actually how to construct a building, not just how to draw a nice one. (David)

Figure 9. Architects learning dynamics regarding leadership involvement



Source: Researcher

Educational Researchers (EDR)

EDR. 1 Strong relationship with the leadership figure

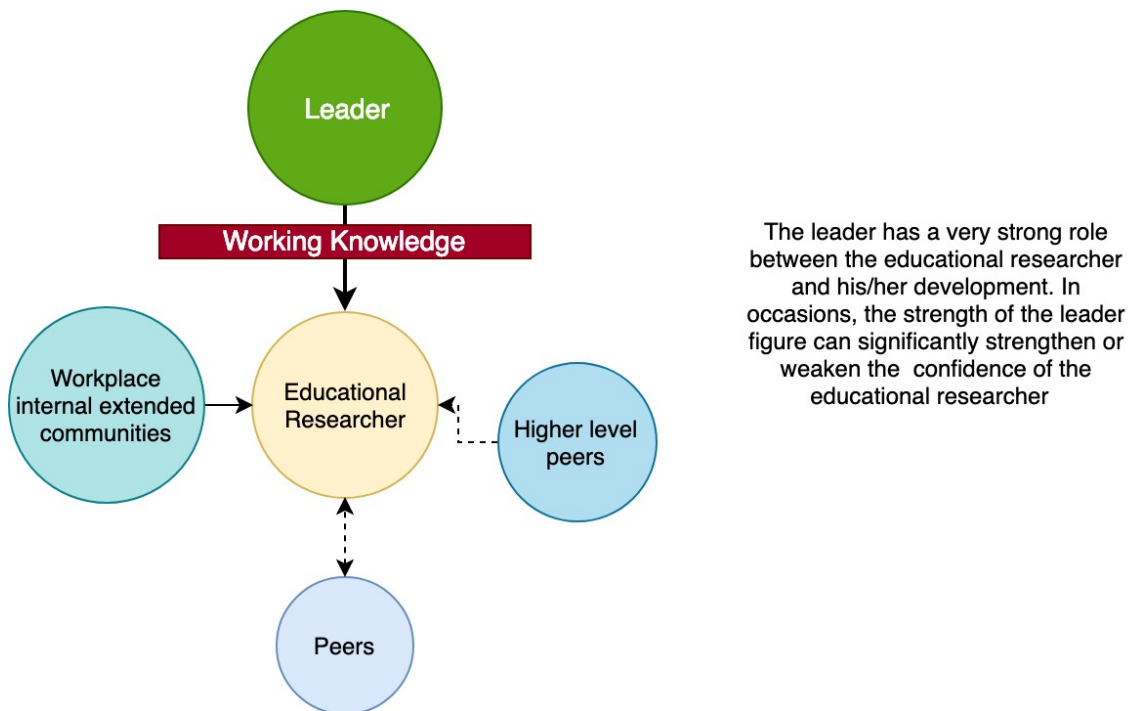
Educational researchers seem to have a strong relationship with the leadership figure in terms of knowledge acquisition, however this can be either a positive or a negative attribute as in case the relationship is not better than ideal, it may create a negative effect on the researcher:

I would say that my relationship with the supervisor made me so insecure in the beginning that I didn't think that my ideas or opinions are worth sharing (Patricia)

It was very difficult to work with my supervisor, I would have weeks and months of silence by her followed by a message in which (supervisor's name) expected me to deliver many pages of topics she believed I should have developed, but how could I? I didn't have any guidance and (supervisor's name) expected me just to show up with papers and chapters out of nowhere (Daniela)

Yes, sometimes was difficult but, I have been working in similar situations before, now I'm confident and I can work on my own but of course, when I had my first research project I blindly trusted my supervisor who used to demoralize me easily (Freija)

Figure 10. Educational researchers learning dynamics regarding leadership involvement



Source: Researcher

Human Resources (HR)

HR1. Openness to new knowledge (group).

Open to receive feedback not just regarding recruitment but also concerning what is missing in the entire HR department processes as well as the newcomers' specific roles:

we did not have protocols for interviews... after realizing that our administration system was highly inefficient, I became in charge to develop a protocol for all that – missing procedures- (Phone interviews, language skills interview, etc). Building up systems was an intuitive task for me, but it was hard to find answers on the internet, and neither of my colleagues could find helpful answers (Byron)

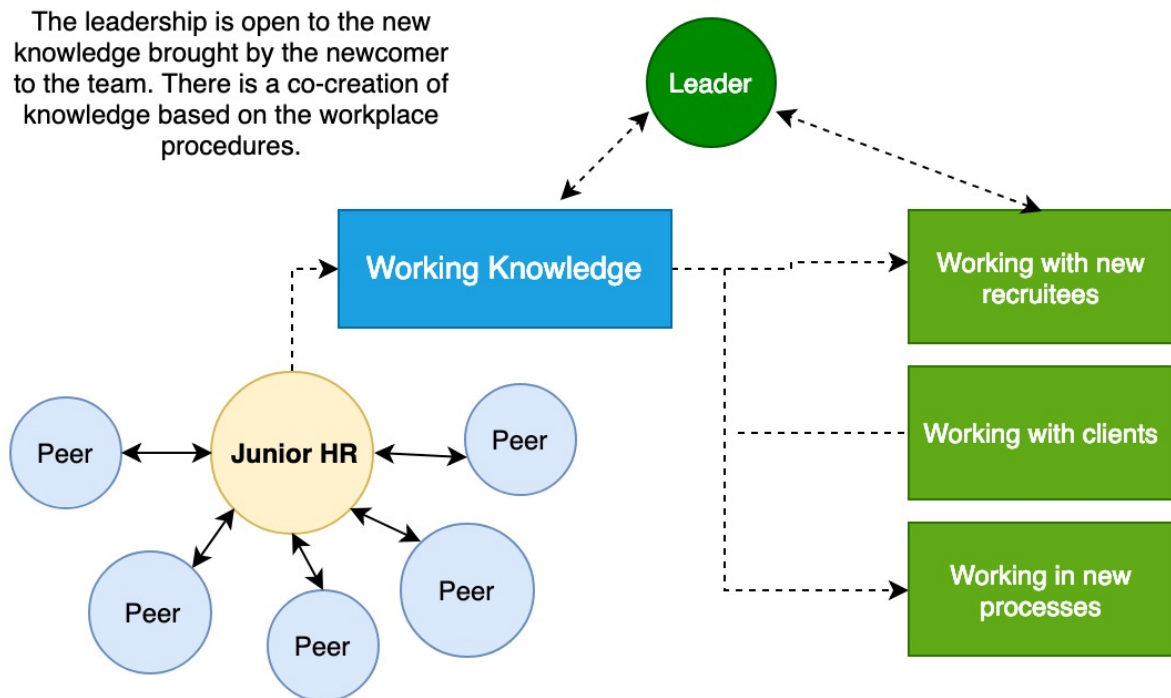
HR 2. Delegation.

Delegating important activities to new people in the position:

You come, and you immediately start to work on something, either on some project, or some job further that is coming, and you need to prepare materials, you need to organize the logistics of that, but also recruitment. So for example, we need to find the payroll manager and you need to learn, and so you're learning on the job

observing the senior who is working on it. And that's how we will get the knowledge this is the strongest, I have to say (Berta)

Figure 11. HR officers learning dynamics regarding leadership involvement



Source: Researcher

Information and Technology (IT)

IT1. Continuous sharing online and offline.

The IT individuals interviewed for this study had a very strong views about knowledge sharing:

Every morning at 9:30 we must be here. And also we have some people in the main company, the headquarter, and they have a Skype call. This is so called-- maybe you know it, a stand up meeting. Which means that we have to stand up everyone has to stand up in front of the computer we have to ask, am not sure we have to answer three questions. What did you do it yesterday? What are you going to do today? And what are your programs in the current task which you are working on? So this can be a kind of knowledge transfer at the beginning that it mustn't be more than, I don't know, 5 or 10 minutes and everyone has to answer all these three questions. It's a good way to know who is working on what and also they are going to know what I'm working

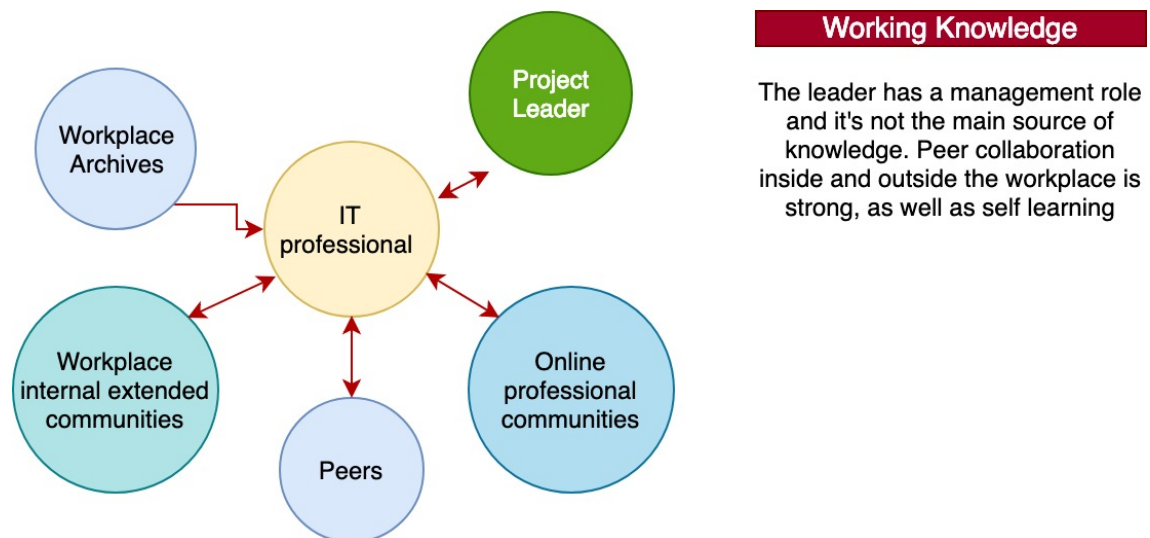
on and what kind of problems I have. If I tell the team that I have some kind of problem at least one of the person can point what to do, who to ask, which document I should read and so on. (Sebastian)

IT2. Continuous learning

There is a sense of need of constant learning and actualization of knowledge between the members of the sample interviewed for this thesis:

...we feel that whenever we have a new technology we should get the information somehow. And if you all know that physical-- going to a course, maybe one or two day course for an external company, it's nice because you are kind of forced to go there. And when you wonder you must watch how it's working. (Sebastian)

Figure 12. IT professionals learning dynamics regarding leadership involvement



Source: Researcher

1.3 How can such processes become adequate in order to be adapted as innovations to the teaching profession?

In order to answer this question, it is necessary to check how important the elements identified in the VET profession are pertinent to other professions, being these elements:

leadership and introductory systems. In the following lines three elements are identified for the entire sample:

- Features of the workplace that support professional learning
- Impact of the participation on communities of practice on individual professional learning
- Impact of the individual professional learning in the communities of practice

At the end of this chapter it will be shown that:

1. Leadership is a strong influencer of professional learning in all the professions included in this study and in order to implement the possible “solutions” identified in this dissertation it becomes necessary to work with VET teachers in leadership positions
2. If the alternatives found in this work are to be implemented, trust must be developed in the knowledge sharing area of the community.
3. One person inside the community could make a considerable difference, the whole sample showed that individual learning can create a considerable positive impact on the community, for instance, in order to implement any alternative to the challenges existing in the VET teaching profession, it is necessary to have the participation of non-leadership profiles of the community in any initiative or intervention to take place.

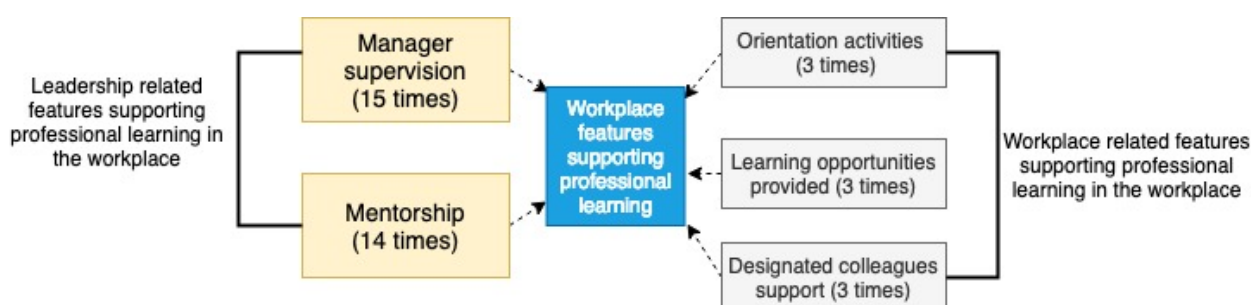
1. Features of the workplace that support professional learning:

When inquired about the workplace features that support professional learning, most of the participants (15) stated that supervision by their manager or director greatly supported their professional learning. Other professionals (14) underlined that for them, formal or informal mentorship was the strongest promoter for professional learning. Some of the participants (3) said that they participated in “orientation activities” in order to start their work while few mentioned that they were “socially integrated” to the workplace which

helped their professional learning. Finally, three of the participants added that “learning opportunities” provided by their workplaces were pivotal for their professional learning to happen.

From what was previously mentioned it is reasonable to believe that during the induction period of the professionals included in this study, the leadership element is extremely valued as well as equally important across all the participant professions.

Figure 13. Workplace features supporting professional learning



Source: Researcher

Some of the sample answers concerning workplace feature for professional learning are given below:

*“Well I think because I had many times the **supervision** you can imagine that at the beginning, of course, after every session, my supervisor helped me and I also had different supervisors. So it was also good that you learn different styles. I got different feedback so but they were really after some time in the background. So even, I think they may be their own version I think. So I was quite of doing my own job as well.”* **HR-003**

*“Yeah. We had great classes that have me to build on philosophy and methodology. That was really important. My personal **mentorship** like the way my supervisor had one on one conversations about what my methodology is about, which is ethnography and my supervisors is a great expert on that. And that is also really important conversations, even if they only lasted like half an hour, 20 minutes for the web, you know, clear direction, this*

author is really important if you want to understand the key of the paradigm blah, blah”

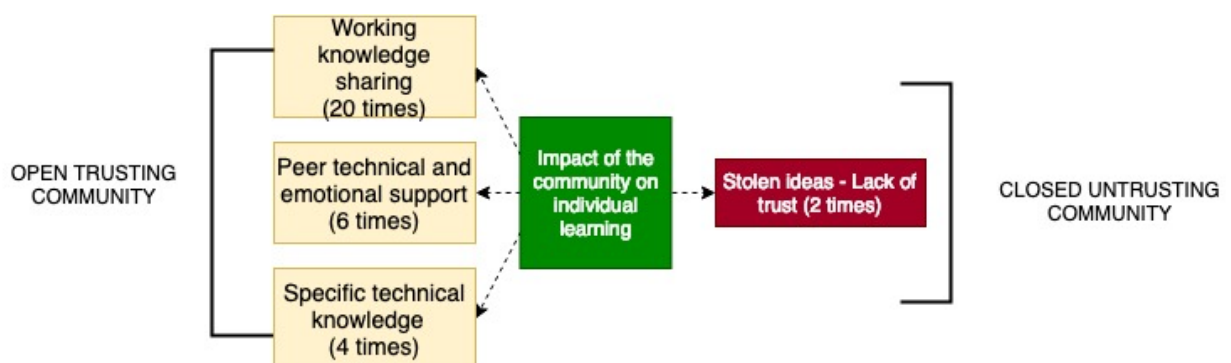
EDR- 001

“Yes. So there was like a new hire **orientation** in Munich where every new employee goes in the beginning so it's two days of lectures. Very generic ones like how the company works, who founded it, what are basic principles there, basic values about people there like what's their nature like what's their philosophy? So that was like two days in Munich and then I got this basic introduction from my manager, from that guy that was actually leading the team. Which was the email and some initial tasks that were easy at the beginning and then I was just really very quick in this job to start doing something useful opposed to the previous one, because it's much simpler....” **IT-001**

“At the end of the day, I really have to say that, I have learned a lot, I gained a lot from being involved in a lot of different things because I got to work together with a lot of experienced researchers. I was--I am still highly involved in the work of my research group. And there we have senior junior researchers, PhD students so you know I really have access to a lot of people and a lot of **learning opportunities**....” **EDR-004**

2. Impact of participation of the communities of practice on individual professional learning.

Figure 14. Impact of the Community on Individual Learning



Source: Researcher

Considering the impact of participation on communities of practice on individual professional learning, two types of communities were identified, the first one can be classified as an open-trusting community in which the new members reach for colleagues for advice and support. The second one can be identified as a closed untrusting community in which knowledge and information are kept from the rest of the community.

The general results considered by most of the participants (20), stated that community knowledge sharing helped with their individual professional learning in their workplaces while others (6) mentioned that one-on-one peer support was very effective in their individual professional learning. Some of the participants (4) expressed that they supported in the acquisition of technical knowledge for their individual professional learning and few of them (2) said that they got their ideas and projects stolen by their peers. Some of sample answers about the impact of participation on communities of practice on individual professional learning are given below:

*“There was a period when we didn't have so intense workload and then we were spending that time on learning a software and each of us definitely did sort of **knowledge sharing** so each of us was delegated each other rather to explore one section or one feature of the software. And then we were meeting and explaining it to each other. We were also making a booklet with a sort of tutorial about this after, this was the one sort of knowledge sharing, a quite specific one or unusual one for me Yeah, I couldn't tell other types of knowledge sharing other than the usual ones. Like what happens when you were working on the project, you're talking with your teammates or peers.”* **HR-002**

*“we actually developed a **peer buddy support system** and since I'm from Serbia, there are some people that are trying to start their PhD here and since they know that I went through the same thing two and a half years ago they contacted me...”* **EDR-004**

*“Let's say this sort of knowledge about the building constructions like how to make the building waterproof or water tight and this sort of like **technical knowledge** of like actually*

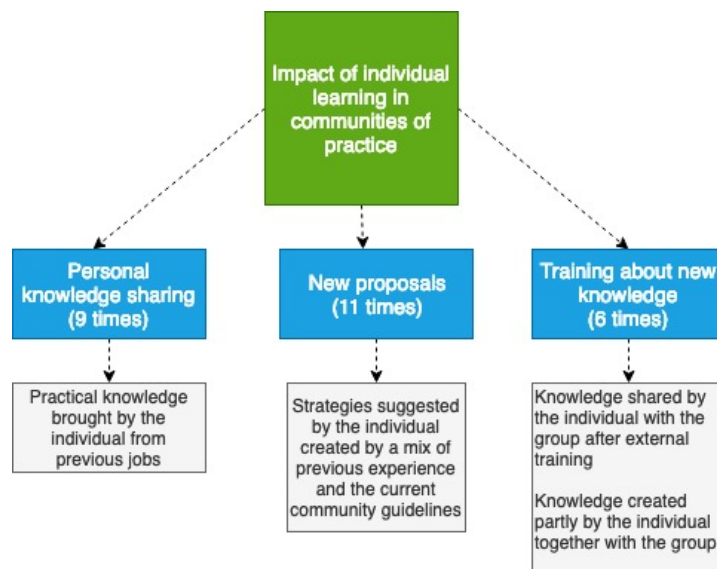
how to construct a building, not just how to draw a nice one and I got this from my colleagues and they learnt it from engineers that work with them.” ARQ-004

Well, if I could go back in time to the beginning of my career, I would tell to myself “don’t be so naïve” If I knew a few years ago what I know now...I think that I would share more information with my environment but being careful about it. I used to share my ideas gladly but (I learnt that) it’s not the best. You can share a little bit and if you see any change (response from your colleagues) then you share more info...share info in exchange of info... (for example) some of my colleagues stole my ideas, developed a project and didn’t even invite me to the project after VET-004

3. Impact of the individual professional learning in the communities of practice:

As we can see in the figure bellow individual learning created three different types of “impact” in the communities that were both common and important for the entire sample. This leads to infer that while trying to implement the possible solutions identified in four professions for the teaching profession, the participation of just one member of the community could produce significant change in the system.

Figure 15. Impact of individual learning on community of practice



Source: Researcher

Concerning the impact of the individual professional learning in the communities of practice, a third of the participants (9) said that they shared their professional knowledge to contribute to the community, especially newcomers or people recently transferred to their area or project, whereas others (8) proposed or suggested ideas to solve challenges that had arisen in a project they worked in however, the focus on solving problems sometimes got the professionals closer to the community however in some occasions it worked otherwise. Some other participants (11) stated that they had trained their colleagues once they had learnt something new through external trainings.

Some sample answers regarding the impact of the individual professional learning are transcribed below:

*“It was too much I would be more chilled out right now because I was just so focused on **solving the problems** that I was not very nice to other people, I would say. I wasn't open or communicative at all. I guess I was offending them. Sometimes my manager and staff didn't pay back well. It wasn't like I could be more pleasant, and it would be much more easy.”* **IT-001**

As I mentioned, there were two foreign people in the job (myself and a colleague), so obviously we had a different perspective and different educational background than our local colleagues. So, there was a lot of knowledge we could pass related to this basic differences. For instance, we knew about different types of software, design and drawing techniques **ARC-001**

Every time someone goes to a training outside the office, we just organize a meeting in which our colleague shares what he or she learnt **HR-0**

CHAPTER 5 – Discussion and Conclusion

This study is an attempt to study professional learning from an innovative trans-professional perspective, however the use of techniques from other professions to improve the teaching profession may be something that has not been attempted before, it's an important step to contribute to the search of original alternatives to persistent challenges in the VET teaching profession.

Professional learning for teachers should be about constructing knowledge in relation to teaching, and processes of learning (Wilson, 2015). Davis, Sumara & Luce-Kapler (2000) describe learning as a complex process in their claim that “knowledge is contingent, contextual, and evolving; never absolute, universal or fixed” (p.78 as cited in Wilson, 2015). Each school, each teacher, each classroom must be understood as a micro-cosmos in which different forces act and may generate different consequences.

Looking at what other professions have to add in terms of answers for the teaching profession may end up being surprising for some readers, however statistics are in favor of this dissertation. By 2030 it is estimated that the average worker will change profession three times and change occupation 17 times, bringing with him/herself the knowledge acquired from previous professions and occupations' experiences for instance, we are looking at a mobile professional population that will transfer this knowledge from other professions to their workplace. In this sense, if the people and the labor market change and transform itself based on knowledge acquired in other professions why can't the professions per se evolve? How the teaching profession can benefit from the knowledge of other professions is what based the scientific curiosity of this study. This final chapter discusses the *implications* of the strategies extracted from other professions which can positively improve and enhance the teaching professional. *Limitations* of the study ranging from career and participant selection to data collection are also discussed. Finally, *recommendations* for applications of the findings of this thesis are discussed.

5. 1. Regarding findings implications

The reason for relying on complexity theory to study professional learning lies as Ball (2005) neatly summarized, in the description of complexity theory: “[Complexity science] is

a science of collective behavior” (as cited in Mason, 2008, p.1). At its core, complexity theory provides a relevant method of examining and gauging the inner workings of complex systems. As opposed to complicated systems - wherein the whole is considered equal to the sum of its parts, and the nature of which may be ascertained by breaking the system apart and closely examining its components - complex systems manifest their complexity at the system level itself (Cochran-Smith et al., 2014, p.107).

Essentially, complexity theory holds that breaking down a system into its components and studying them isolated from one another leads to a significant loss in understanding how key aspects of the system work - since the non-linear interactions and the intricacy of various feedback loops operating at both the intra-component as well as inter-component level are lost. Thus, while inferences are certainly possible when treating complex systems as complicated systems instead, such inferences are bound to be fallible in the absence of any understanding of the dynamic interactions between all participant components at the system level.

In this manner, complexity science provides relevant lenses for analyzing dynamic social phenomena resulting from both intentional and emergent processes (Lichtenstein, 1995). As must be clear by this point, this methodological approach is well suited for a study based in critical realism. Since both critical realism and complexity theory eschew the loss of contextual information and the dynamic operational variables resulting from said context, this qualitative approach allows the researcher to provide a meaningful glimpse into a social system in operation, while respecting the minutiae and nuances which affect, inform, and drive the participant actors of said system - in a bid to understand how the system and the individual components influence the nature and actions of each other as a whole.

In order for the researcher to be able to understand the phenomena of professional learning, a reasonable understanding of the elements that could affect or inhibit the acquisition of learning within the professional scope needed to be studied as a whole i.e. how different relationships may affect the acquisition of learning and how this learning may affect the environment in which the learner cohabits with his/her peers.

The results of this research were obtained after investigating the learning structure of four different professions based on demands expressed by the VET teachers group. According to this investigation four different realities emerged, for example, the group of architects had a tendency of being strongly influenced by their leader or project leader, who could either grant or deny access to fellow architects of accessing the project stake holders from whom the fellow architects could have learnt from. For example, the architect group features are:

1. Project-based work
2. Leadership is highly empowered and has proper delegation skills, and
3. A rather horizontal structure in which knowledge is openly communicated.

These could impact positively if transferred to the VET teaching profession.

First of all, project-based initiatives are not by no means new to the educational area, however, positive outcomes stemming from it means broadening the sense of community and collaboration for the VET teachers. Secondly, proper leadership empowerment is something deeply needed in the VET profession as said by some of the VET professionals interviewed in this research and better leadership transition periods in which all the information needed for the professional success of the new leader is passed by the previous one, a proper transition procedure should be done with external support and is a trait that could be borrowed from architects and be helpful to the VET teaching profession. Finally, having a more horizontal structure is important for knowledge sharing in the VET profession, since the middle management levels that have been created in it have reached levels that inhibit knowledge sharing although seem to be superficially effective for the management of administrative procedures. However, more research has to be done since it was quite obvious for the researcher that the lack of democratic principles in a highly bureaucratic structure in the VET profession has systemic roots.

Concerning the findings in the educational research group, the strong relationship between the educational researcher and the leader is very evident however, this finding has to be taken with a grain of salt since the expectations of the junior educational researcher towards the supervisor is so strong that could undermine the confidence to produce research,

as expressed by five out of seven interviewees who are early stage researchers and seem to be affected by their relationship with their leader or in this case, supervisor.

Regarding the findings in the area of HR, it is important to note that the *openness to new knowledge* as mentioned by the whole group and not just the leader, becomes a valuable finding for this research. In the VET teaching profession the sample indicated that there was a strong sense of *deeply established bureaucracy* in which new knowledge was not taken into consideration unless in a few exceptions, for example, when personal relationships are established and these relationships foster stronger professional collaboration. Also, the capacity of the leader to delegate tasks and responsibilities is a very important trait identified in this research that should be passed on from the HR profession to the teaching profession, however, this should be approached as training both to the leader and the community.

Finally, in relation to the IT profession, according to the results of this research the best possible application identified to be of great advantage to the VET teaching profession are the strategies for knowledge sharing used in the community such as the IT profession *stand up meeting* in which all members of the community designate some time every day to share their current projects and challenges with the rest of the group. Having a short meeting with the closest colleagues about the members of the community current challenges are likely to benefit the communication processes as well as to create a better environment for knowledge sharing.

5.2. Limitations of the study

5.2.1. Limitations Pertaining to Sample Size

It must be acknowledged that in order to produce actionable knowledge on complex systems, especially when dealing with subjects as heavily revolving around the capabilities and motives of an individual as learning systems and their interaction with individuals participating in them - the sample size must be large enough to cover a plethora of socio-economic, intellectual, emotional, and professional variables. However, owing to realistic limitations upon the resources and capacity of the doctoral candidate performing this study to connect with and recruit professionals within the designated regions in the time-frame

allocated for the study, the sample size - though covering a wide breadth of professions and individual experience - had to be limited to 25 participants mainly living and working in Eastern Europe.

However, considering that 12 professionals available for recruitment had participated in the pilot study, thus having to be disqualified in order to preserve the integrity of a fresh study among a larger sample group, the 25 final participants were chosen amongst several others, in order to meet the criteria for the study without incurring on any known or unknown bias that would affect the final conclusions drawn from the primary data.

5.2.2. Limitations Pertaining to Data Collection

While the aim of the exercise when gathering participants for interviews was to provide an environment through which interviewees could be encouraged to talk about the subject matter more openly than a set of structured questions could allow - there were limitations faced by the researcher while performing this step.

Owing to both geographical and time constraints, five out of the 25 participants had to be interviewed via Skype. Some of them did clear time for the researcher to sufficiently go through the list of questions from the questionnaire as well as converse about topics related to the overarching queries of the study in enough detail, making it possible to acquire relevant contextual data and provide deeper insight into the inner workings of their professional learning system. However, others participants interviewed over virtual platforms not putting aside sufficient time to do so, provided just enough data to cover the points of the questionnaire without necessarily informing the researcher more about the dynamic structure and working of key elements in their learning system.

As is understood in social research delving into non-linear relationships where context may provide key insights into the data collected from participants, what a researcher is unable to record while gathering data may often be regarded as significant as the data collected. To that end, while the researcher was able to interview some of the participants in their workplace in order to gauge their interaction with the system first-hand, in other cases the interviews were held in places unrelated to their offices, such as cafeterias, places of residence, etc.

Furthermore, five participants did not consent to their age being stored within the collected data. Three participants among the 25 either did not consent to the reporting of or mention to the researcher their highest academic levels. Six participants either did not consent to the reporting of or mention to the researcher their details regarding their years of professional experience in general, the number of years spent by them in their current field, and the number of job positions held by them in said time. One participant was unable to recall the number of job positions held by him in his professional life within the current field.

Lastly, while the socio-economic context and its impact on attitudes and barriers to learning was an important piece of the complex system which the researcher sought to study, there was meager data provided in this aspect of the research by the participants. A major reason behind this was that the most participants interviewed were often not from the country where they were operating. They either had not yet spent enough time in that localized environment to fully realize the impact of the socio-economic context in their ability to interact with their communities of practice in order to gain new knowledge and skills, or had become participants in communities of practice or networks of learning driven by other non-native professionals such as themselves - such individuals and networks being slightly more resistant to an immediate impact of changing socio-economic contexts on their daily realities and experiences.

5.2.3. Limitations Pertaining to Recruitment Methodology

Since the objective of this study was to gain deeper insight into the interaction of individuals with communities of practice localized within their organizational systems, the recruitment method of snowball sampling was chosen not only because it would aid the researcher in being able to gather appropriate participants within the time frame that might pass the selection criteria, but also because this method of recruitment would increase the likelihood of being able to include multiple components from the same organizational systems in order to better study their interaction and impact in relation to their position in the organizational hierarchy.

It must be admitted, however, that this system certainly has its theoretical drawbacks. By recruiting participants who were referred to the researcher by others already participating in the study, it is possible that the statistical chances of including individuals who are treated

as outliers within the organization or within the specific social systems of which the participants were a part of, may have been greatly decreased. Thus, outlier data from participants which would have been particularly useful in gauging the impact of socio-economic context and related practices either supporting or negating the impact of social or economic inequality at their organizations was potentially lost from the primary data of this study. While some such data may still exist within the primary information collected, the social nature of snowball sampling would ensure that its impact would not necessarily be distinctly pronounced enough to throw light on these non-linear causal mechanisms affecting learning experiences in workplace organizational systems.

Furthermore, It would be difficult to distinguish whether the conclusions drawn from the data collected in such case would be applicable to the experience of individuals suffering under engendered practices of exclusion due to their social, national, or economic backgrounds, or whether it would be applicable to the groups of persons perpetrating the same. While some inferences to this end are certainly possible, given that most participants of this study were not native to the country in which they operated at the time of the study - the path to such inferences would be supplemented by the researcher's understanding of contemporary economic problems within the European marketplace and personal experience of consequent treatment of non-natives within a professional organization, and not entirely drawn from data gathered during the course of this study. However, some data still does exist within the collected information pointing towards the barriers in knowledge sharing faced by professionals working outside their native countries - as referenced in section 3.2.1 - and has been coded and analyzed within this study.

5.3. Recommendations

More research about trans-professional learning needs to be done, it's quite difficult at this point to foresee all the possibilities of this field, however, there is a lot of missed knowledge that could be used in several professions in a plethora of situations, however just more time and research will bring a clearer light about this topic.

For further studies, I first recommend adding a larger number of professions to the study. The present study was limited by time and the participation of just one main researcher

and time pressure which made it difficult to collect more information, however, if possible, more resources should be added to further studies in order to collect more information

The second recommendation is to try broadening the scope of workplaces: small, medium, large organisations, where the sample works in order to have a holistic view of the development of the professions in different workplace realities. Being aware of these recommendations may help future social scientists to have a wider view of how different professions learn by gathering more information about them. I wrote this dissertation with the aim of researching about professional learning not just in the teaching profession but in other professions as well. From this research I have been able to understand that professional learning is an ever changing and growing field, for instance we must change, grow and evolve with it.

References

- Akkerman, S. F., & Bakker, A. (2011). Boundary crossing and boundary objects. *Review of Educational Research*, 81(2), 132-169. doi:10.3102/0034654311404435
- Alvesson, M. (2012). *Understanding organizational culture*. London: Sage.
- Berg, B. L. (1989). A dramaturgical look at interviewing. In *Qualitative research methods for the social sciences* (4th ed., pp. 67-93) Boston, MA.: Allyn & Bacon.
- Berg, S. A. (2008). Factors that Influence informal learning in the workplace. *Journal of Workplace Learning*, 20(4), 229–244
- Berta, W., Cranley, L., Dearing, J. W., Dogherty, E. J., Squires, J. E., & Estabrooks, C. A. (2015). Why (we think) facilitation works: Insights from organizational learning theory. *Implementation Science*, 10(1), 1.
- Bierema, L., & Eraut, M. (2004). Workplace-focused learning: Perspective on continuing professional education and human resource development. *Advances In Developing Human Resources*, 6(1), 52-68. doi: 10.1177/152342230326085
- Billett, S. (1996). Situated learning: Bridging sociocultural and cognitive theorising. *Learning and Instruction*, 6(3), 263-280. doi: 10.1016/0959-4752(96)00006-0
- Billett, S. (2001). Learning through work: Workplace affordances and individual engagement. *Journal of Workplace Learning*, 13(5), 209-214.
- Billett, S. (2004). Workplace participatory practices: Conceptualising workplaces as learning environments. *Journal of Workplace Learning*, 16(6), 312-324.
- Bolam, R., McMahon, A., Stoll, L., Thomas, S., Wallace, M., Greenwood, A., ... & Smith, M. (2005). *Creating and sustaining effective professional learning communities*. Bristol: University of Bristol.
- Bova, B., & Kroth, M. (2001). Workplace learning and Generation X. *Journal Of Workplace Learning*, 13(2), 57-65. doi: 10.1108/13665620110383645
- Bracken, S. (2010). Discussing the importance of ontology and epistemology awareness in practitioner research. *Worcester Journal of Learning and Teaching*, (4). Retrieved November 11, 2018, from <https://eprints.worc.ac.uk/843/1/FinalSBrackenPractitionerResearch.pdf>
- Cairns, L. (2011). Learning in the workplace: Communities of practice and beyond. In M. Malloch (Ed.). *The SAGE handbook of workplace learning* (pp.73-85) London: SAGE Publications

- Callanan, M., Cervantes, C., & Loomis, M. (2011). Informal learning. *Wiley Interdisciplinary Reviews: Cognitive Science*, 2(6), 646-655. doi: 10.1002/wcs.143
- Chivers, G. (2011). Supporting informal learning by readers in investment banks. *Journal of European Industrial Training*, 35(2), 154–175.
- Cilliers, P. (2002). *Complexity and postmodernism: Understanding complex systems*. London and New York: Routledge.
- Cochran-Smith, M., Ell, F., Grudnoff, L., Ludlow, L., Haigh, M., & Hill, M. (2014). When complexity theory meets critical realism: A platform for research on initial teacher education. *Teacher Education Quarterly*, 41(1), 105-122.
- Cochran-Smith, M., Ell, F., Ludlow, L., & Aitken, G. (2014). The challenge and promise of complexity theory for teacher education research. *Teachers College Record*, 116(5), 1-38.
- Cohen, L., Manion, L., & Morrison, K. (2007). Interviews. In *Research methods in education* (6th ed., pp. 349-382). London: Routledge.
- Commission of the European Communities. (2000). A memorandum on lifelong learning. *SEC (2000)*.
- Craib, I. (2015). *Modern social theory*. London: Routledge.
- Cross, K. P. (1981). *Adults as learners*. San Francisco: Jossey-Bass
- Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522-537.
- Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession*. Washington, DC: National Staff Development Council.
- Diaz-Maggioli, G. (2004). *Teacher-centered professional development*. Virginia: ASCD.
- Dillon, J., & Wals, A. E. (2006). On the danger of blurring methods, methodologies and ideologies in environmental education research. *Environmental Education Research*, 12(3-4), 549-558. doi:10.1080/13504620600799315

- Dochy, F., Smet, K., Govaerts, N., & Kyndt, E. (2018). Antecedents of informal workplace learning: A theoretical study. In *Informal learning at work* (pp. 28-55). London: Routledge.
- Doonan, F., Taylor, L., Branduardi, P., & Morrissey, J. P. (2018). Innovative training networks: Overview of the Marie Skłodowska-Curie PhD training model. *FEMS Microbiology Letters*, 365(19), p. 207.
- Doornbos, A., Simons, R., & Denessen, E. (2008). Relations between characteristics of workplace practices and types of informal work-related learning: A survey study among Dutch Police. *Human Resource Development Quarterly*, 19(2), 129-151. doi: 10.1002/hrdq.1231
- Duncan-Howell, J. (2010). Teachers making connections: Online communities as a source of professional learning. *British Journal of Educational Technology*, 41(2), 324-340.
- Engeström, Y., Engeström, R., & Kärkkäinen, M. (1995). Polycontextuality and boundary crossing in expert cognition: Learning and problem solving in complex work activities. *Learning and Instruction*, 5(4), 319-336. doi:10.1016/0959-4752(95)00021-6
- Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70(1), 113-136.
- Eraut, M. (2011). Informal learning in the workplace: evidence on the real value of work-based learning (WBL). *Development And Learning In Organizations: An International Journal*, 25(5), 8-12. doi: 10.1108/14777281111159375
- European Commission. (2017). *Interim evaluation of Horizon 2020*. Retrieved on July 30, 2018 from <http://ec.europa.eu/>
- Evans, K., & Waite, E. (2010). Stimulating the innovation potential of 'routine' workers through workplace learning. *Transfer: European Review Of Labour And Research*, 16(2), 243-258. doi: 10.1177/1024258910364313
- Farnsworth, V., Kleanthous, I., & Wenger-Trayner, E. (2016). Communities of practice as a social theory of learning: A conversation with Etienne Wenger. *British Journal of Educational Studies*, 64(2), 139-160.
- Felstead, A., Fuller, A., Unwin, L., Ashton, D., Butler, P., & Lee, T. (2005). Surveying the scene: Learning metaphors, survey design and the workplace context. *Journal of Education and Work*, 18(4), 359-383.
- Fenwick, T. (2008). Understanding relations of individual—collective learning in work: A review of research. *Management Learning*, 39(3), 227-243.

- Fuller, A., Unwin, L., Felstead, A., Jewson, N., & Kakavelakis, K. (2007). Creating and using knowledge: an analysis of the differentiated nature of workplace learning environments. *British Educational Research Journal*, 33(5), 743–759.
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945.
- Gershenson, C. (2008). *Complexity: 5 questions*. Automatic Press/VIP.
- Grix, J. (2002). Introducing students to the generic terminology of social research. *Politics*, 22(3), 175-186. doi:10.1111/1467-9256.00173
- Guldborg, K., & Mackness, J. (2009). Foundations of communities of practice: enablers and barriers to participation. *Journal Of Computer Assisted Learning*, 25(6), 528-538. doi: 10.1111/j.1365-2729.2009.00327.x
- Halpern, D. F., Donaghey, B., Lamon, M., & Brewer, W. F. (2002). Learning theory. *Encyclopedia of education*, 2, 1458-1469.
- Hearst, E. (2018). Stimulus relationships and feature selection in learning and behavior. In *Cognitive processes in animal behavior* (pp. 51-88). London: Routledge.
- Herbert, S. (2008). Collateral learning in science: students' responses to a cross-cultural unit of work. *International Journal Of Science Education*, 30(7), 979-993. doi: 10.1080/09500690701345468
- Herrington, J., Reeves, T. C., & Oliver, R. (2014). Authentic learning environments. In *Handbook of research on educational communications and technology* (pp. 401-412). New York: Springer.
- Hicks, E., Bagg, R., Doyle, W., & Young, J. (2007). Canadian accountants: examining workplace learning. *Journal Of Workplace Learning*, 19(2), 61-77. doi: 10.1108/13665620710728457
- Hill, M. R. (1984). Epistemology, axiology, and ideology in sociology. *Mid-American Review of Sociology*, 9(2), 59-77. doi:10.17161/str.1808.4967
- Hirsh, S., & Killion, J. (2009). When educators learn, students learn: Eight principles of professional learning. *Phi Delta Kappan*, 90(7), 464-469.
- Hoekstra, A., Korthagen, F., Brekelmans, M., Beijaard, D., & Imants, J. (2009). Experienced teachers' informal workplace learning and perceptions of workplace conditions. *Journal Of Workplace Learning*, 21(4), 276-298. doi: 10.1108/13665620910954193

- Hoeve, A., & Nieuwenhuis, L. (2008). Researching routines: Innovative lessons from a consultancy firm. In W. J. Nijhof, & L. F.M. Nieuwenhuis (Eds.), *The Learning Potential of the Workplace* (pp. 279-294). Rotterdam: SENSE publishers.
- Hoeckel, K., & Schwartz, R. (2010). Learning for Jobs OECD Reviews of Vocational Education and Training. *Austria: Organisation for Economic Co-operation and Development (OECD)*.
- Høyrup, S. (2010). Employee-driven innovation and workplace learning: basic concepts, approaches and themes.
- Hunter, C. P. (2010). Ways of learning in the pharmaceutical sales industry. *Journal of Workplace Learning*, 22(7), 451–462.
- Husén, T., & Tuijnman, A. (1991). The contribution of formal schooling to the increase in intellectual capital. *Educational Researcher*, 20(7), 17-25.doi: 10.2307/1177001
- Illeris, K. (2018). A comprehensive understanding of human learning. In *Contemporary theories of learning* (pp. 1-14). London: Routledge.
- Illeris, K. (Ed.). (2018). *Contemporary theories of learning: learning theorists... in their own words*. London: Routledge.
- International Labour Office, Geneva. (2012). *International standard classification of occupations: Structure, group definitions and correspondence tables..* Geneva: International Labour Office.
- Jarvis, P. (2006). *Towards a Comprehensive Theory of Human Learning*. Oxon: Routledge.
- Jurasaitė-Harbison, E. (2009). Teachers' workplace learning within informal contexts of school cultures in the United States and Lithuania. *Journal Of Workplace Learning*, 21(4), 299-321. doi: 10.1108/13665620910954201
- Knight, P. (2002). A systemic approach to professional development: Learning as practice. *Teaching and Teacher Education* 18, (3), 229-241.
- Knowles, M. (1955). Adult education in the United States. *Adult Education*, 5(2), 67-76. doi: 10.1177/074171365500500201
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (1998) *The adult learner: The definitive classic in adult education and human resource development*. Houston, TX: Gulf

- Kohli, W. (2018). Bringing Dewey into the adult higher education classroom. *New Directions For Adult And Continuing Education*, (158), 57-65. doi: 10.1002/ace.20279
- Lans, T., Biemans, H., Verstegen, J., & Mulder, M. (2008). The influence of the work environment on entrepreneurial learning of small-business owners. *Management Learning*, 39(5), 597-613. doi: 10.1177/1350507608098117
- Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge: Cambridge University Press.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Le Clus, M. (2011). Informal learning in the workplace: A review of the literature. *Australian Journal of Adult Learning*, 51(2), 355–373.
- Levinsen, K., & Sørensen, B. (2011). Formalized informal learning. *International Journal Of Digital Literacy And Digital Competence*, 2(1), 7-26. doi: 10.4018/jdlcdc.2011010102
- Li, J., Brake, G., Champion, A., Fuller, T., Gabel, S., & Hatcher-Busch, L. (2009). Workplace learning: The roles of knowledge mccessibility and Management. *Journal of Workplace Learning*, 21(4), 347–364.
- Lichtenstein, B. M. (1995). Evolution or transformation: A critique and alternative to punctuated equilibrium. *Academy of Management Annual Meeting Proceedings*, (1), 291-295. doi:10.5465/ambpp.1995.17536565
- Liebeskind, J. P., Oliver, A. L., Zucker, L., & Brewer, M. B. (1994). Social networks, learning, and flexibility: Sourcing scientific knowledge in new biotechnology firms. *UCLA Biotechnology Studies*, 6(95), 1-30. doi:10.3386/w5320
- Lukosch, H., & de Vries, P. (2009). Supporting informal learning at the workplace. *International Journal of Advanced Corporate Learning (iJAC)*, 2(3), 39-44. doi: 10.3991/ijac.v2i3.1004
- Malcolm, J., Hodkinson, P., & Colley, H. (2003). The interrelationships between informal and formal learning. *Journal Of Workplace Learning*, 15(7/8), 313-318. doi: 10.1108/13665620310504783
- Marsick, V. (2009). Toward a unifying framework to support informal learning theory, research and practice. *Journal Of Workplace Learning*, 21(4), 265-275. doi: 10.1108/13665620910954184

- Marsick, V. J., & Watkins, K. E. (2003). Demonstrating the value of an organization's learning culture: The dimensions of the learning organization questionnaire. *Advances in Developing Human Resources*, 5(2), 132-151.
- Marsick, V., & Watkins, K. (1992). Continuous learning in the workplace. *Adult Learning*, 3(4), 9-12. doi: 10.1177/104515959200300404
- Martin, L.E., Kralger, S, Quatroche, D. J., & Bauserman, K.L. (2014). *Handbook of professional development in education: Successful models and practices, Pre-K-12*. New York: Guildford Press.
- Mason, M. (2008). Complexity theory and the philosophy of education. *Educational Philosophy and Theory*, 40(1), 4-18. doi:10.1111/j.1469-5812.2007.00412.x
- McCormack, A., Gore, J., & Thomas, K. (2006). Early career teacher professional learning. *Asia-Pacific Journal of Teacher Education*, 34(1), 95-113.
- McLaughlin, B. (1990). "Conscious" versus "unconscious" learning. *TESOL Quarterly*, 24(4), p. 617. doi: 10.2307/3587111
- McPherson, R., & Wang, J. (2014). Low-income low-qualified employees' access to workplace learning. *Journal Of Workplace Learning*, 26(6/7), 462-473. doi: 10.1108/jwl-10-2013-0084
- Milligan, C., Littlejohn, A., & Margaryan, A. (2013). Patterns of engagement in connectivist MOOCs. *MERLOT Journal of Online Learning and Teaching*, 9(2), 149-159.
- Mintzberg, H. (1985). The organization as political arena. *Journal of Management Studies*, 22(2), 133-154.
- Misko, J. (2008). *Combining formal, non-formal and informal learning for workforce skill development*. National Centre for Vocational Education Research. Retrieved on November 18, 2016 from <http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED503360>
- Moon, J. (2007). Reflection in learning & professional development. Theory & practice. New York: RoutledgeFalmer Publishers.
- Morgan, S. (2006). Transfer of Taylorist ideas to China, 1910-1930s. *Journal Of Management History*, 12(4), 408-424. doi: 10.1108/1751134061069276
- Myers, K., & Sadaghiani, K. (2010). Millennials in the workplace: A communication perspective on millennials' organizational relationships and performance. *Journal Of Business And Psychology*, 25(2), 225-238. doi: 10.1007/s10869-010-9172-7

- Newman, S., & Hatton-Yeo, A. (2008). Intergenerational learning and the contributions of older people. *Ageing Horizons*, 8(10), 31-39.
- Nieuwenhuis, L., & Van Woerkom, M. (2007). Goal rationalities as a framework for evaluating the learning potential of the workplace. *Human Resource Development Review*, 6(1), 64-83. doi: 10.1177/1534484306296432
- Nijhof & L. F. Nieuwenhuis (Eds.), *The Learning Potential of the Workplace* (pp. 3-13). Rotterdam: SENSE publishers.
- Noy, C. (2008). Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of Social Research Methodology*, 11(4), 327-344. doi:10.1080/13645570701401305
- Office of Superintendent of Public Instruction. (2018). *Professional learning*. Retrieved on November 8, 2018 from <http://www.k12.wa.us/CurriculumInstruct/ProfessionalLearning/default.aspx>
- Opfer, V. Darleen, and Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research*, 81(3), 376-407.
- Pankhurst, K. V. (2010). Learning by experience, work and productivity: Theory and empirical evidence. *Journal of Vocational Education and Training*, 62(2), 103–122.
- Pesti, C. (2019) The evolution of teacher education programs in different countries with a special focus on the role of practicum in developing teacher competencies DOI: 10.15476/ELTE.2018.237
- Phelps, R., & Graham, A. (2012). Exploring teacher professional development through the lens of Complexity Theory: the technology together story.
- Postareff, L. (2007). *Teaching in higher education from content-focused to learning-focused approaches to teaching* (Doctoral dissertation). University of Helsinki. Retrieved February 20, 2015 from <https://helda.helsinki.fi/handle/10138/19882>.
- Rasiński, L., Tóth, T., & Wagner, J. (2017). *European perspectives in transformative education*. Wrocław: Wydawnictwo Naukowe Dolnośląskiej Szkoły Wyższej.
- Reichertz, J. (2004). Abduction, deduction, and induction in qualitative research. In U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A companion to qualitative research* (pp. 150–164). London: Sage.

- Richardson, R., & Kramer, E. H. (2006). Abduction as the type of inference that characterizes the development of a grounded theory. *Qualitative Research*, 6(4), 497-513. doi:10.1177/1468794106068019
- Roberts, J. M. (2014). Critical realism, dialectics, and qualitative research methods. *Journal for the Theory of Social Behaviour*, 44(1), 1-23. doi:10.1111/jtsb.12056
- Roberts, S. (2012). Gaining skills or just paying the bills? Workplace learning in low-level retail employment. *Journal of Education and Work*, 1–24.
- Saunders, M., Lewis, P., & Thornhill, A. (2015). *Research methods for business students* (7th ed.). New York: Pearson Education.
- Schein, E. H. (2010). *Organizational culture and leadership* (Vol. 2). San Francisco: John Wiley & Sons.
- Schön, D. A. (1983). *The reflective practitioner: how professionals think in action*. New York: Basic Books
- Schulz, M., & Stamov Roßnagel, C. (2010). Informal workplace learning: An exploration of age differences in learning competence. *Learning and Instruction*, 20(5), 383–399.
- Sellers, C. S., & Akers, R. L. (2018). Social learning theory: Correcting misconceptions. In *The essential criminology reader* (pp. 89-99). New York: Routledge.
- Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, 134(3), 52-59. doi:10.1162/0011526054622015
- Simple vs. Complicated vs. Complex vs. Chaotic (2008). Retrieved from <http://noop.nl/2008/08/simple-vs-complicated-vs-complex-vs-chaotic.html> (Jan, 3, 2018)
- Skule, S. (2004). Learning conditions at work: a framework to understand and assess informal learning in the workplace. *International Journal of Training and Development*, 8(1), 8-20.
- Stewart, C. (2014). Transforming professional development to professional learning. *Journal of Adult Education*, 43(1), 28-33.
- Sweet, R. (2013). Work-based learning: Why? How?. *Revisiting global trends in TVET: Reflections on theory and practice*, 164.
- Taber, K. (2009). Beware discontinuities in learning. *Physics Education*, 44(2), 117-119. doi: 10.1088/0031-9120/44/2/f01

- Taber, N., Plumb, D., & Jolemore, S. (2008). “Grey” areas and “organized chaos” in emergency response. *Journal of Workplace Learning*, 20(4), 272–285.
- Timperley, H. (2011). *Realizing the power of professional learning*. UK: McGraw-Hill Education.
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational research review*, 3(2), 130-154.
- Von Glasersfeld, E. (1991). An exposition of constructivism: Why some like it radical. In *Facets of systems science* (pp. 229-238). Springer, Boston, MA.
- Walker, G. D. (2014). Using complexity theory to understand the teaching and learning process.
- Washington State Legislature. (2018). *Professional learning-defined-scope*. Retrieved on November 8, 2018 from <http://app.leg.wa.gov/RCW/default.aspx?cite=28a.415.430>
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wilson, D. A. (2015). *On the relationship between complexity theory, professional learning, and lesson study in intermediate mathematics classrooms*. Windsor: University of Windsor.
- Wilson, D., & Hartung, K. (2015). Types of informal learning in cross-organizational collegial conversations. *Journal Of Workplace Learning*, 27(8), 596-610. doi: 10.1108/jwl-09-2014-0070.

APPENDICES

Appendix 1. Analysis of learning perceptions among professionals. Example: HR sector

Five HR officers were interviewed for this study in order to identify features that support informal professional learning in the working context. We were interested to know what helped our interviewees to integrate in the workplace they are working in, and to find out which learning techniques were useful for them to quickly adapt to the job and its responsibilities. After the interview analysis, three major themes emerged: “Different learning techniques”, “Difficulties and barriers in learning”, and “Features that improve learning”.

Different learning techniques

The HR experts we interviewed spoke about different learning techniques that helped them to acquire new skills and knowledge. Overall, the respondents mentioned a wide range of different learning techniques and explained its usefulness in their personal experience. Since we were interviewing HR experts, all of the respondents also had experience themselves in using different learning techniques in order to train new employees or to provide professional trainings for team members. This allowed additional inquiries into the subject we are researching.

1. Mentorship and supervision

Mentorship and supervision have shown to be one of the most important provisions for new employees who come into the company, and all of the interviewees find mentorship or supervision to be an important part of their learning process. Julia, a 31 years old recruiter, spent first two weeks on her job working with her manager and even after this period, she had to rely on her support in order to be sure that she is doing her job well.

“I contacted my manager every time when I felt it was important to ask for a review from her to check what I did was correct. especially if I was preparing a job offer to someone where you're not allowed to make mistakes because then you can correct it, so then I ask her for the first time to check it if I did it well and in some cases after that I also asked for advice or of course there were some cases, some special cases that do not occur very often so we didn't go through everything that can come up during our daily work. So when something unusual happened I could always ask her if she experienced something similar and how she solved it. But after a while based on what I already know I could that on my own and make my own decision” (Julia).

On Julia’s workplace it is a practice that every new employee sits near the mentor during the first few weeks and this has shown as an effective practice.

“So this is in general what we normally follow when there is, we call it management of change, when there is a change in the person who's doing the job. So for the first half the mentor does the job and the new one is watching and then they switch and when they are complete then you can go on your own. I think that helps a lot (...) We do not have a permanent seat in the office. For the team we have an area with like, we are 15 people in the team and we have around 10 desks. That's less I know, because working from home is allowed. And so we have 10 desks and we can book one desk for ourselves in an online system. So but you can switch after one day, after one week or after one month if you don't want to sit always on the same desk but when a new joiner is coming we always try to arrange the whole team so that the new joiner and the mentor can sit together. So it's quite separable.” (Julia).

Having one person that an employee can reach out in the case of need has shown to be important for others too. Zoila had a chance to work under supervision even longer than Julia. Her first job was student counseling and she spent around six months working 20 hours or 25 hours a week under supervision. In her opinion it was very important “to get advice and feedback” from her supervisors in order to write reports about the counseling sessions by herself. Julia shares the same opinion: “The first observing, then trying, and the last one is doing yourself!”

Interviewees also seek mentorship outside of the company, if they can’t find it internally. If she can’t solve the problem by searching for a solution on the internet, Berta tries to contact

older colleagues „who have more experience using these fields or in this job”, but she also contacts older colleagues who have left the company if she thinks are the only ones who could help. On the other hand, we have Zsofi. She started her private practice so this makes her situation a bit more unique. Although she doesn't have superiors in her work, she is ready to pay for a professional who can help her to solve her doubts about important issues.

“Well, I also had contact with one of my supervisors. And it was then of course not through the university anymore, so actually it was quite expensive, because then you have to pay per hour for supervision. But I decided to have it I think first I had it once a week and then once in two weeks so I could bring in some questions and discuss the case especially the ones which I felt might be too difficult. So even I adjust to the transferring to maybe a psychiatrist or to a psychologist with more expertise on that matter. And so it gave me really the feeling that it was more safe to wear that way. At the moment, I also have contact with a supervisor here in Hungary not on a regular basis but if I have question and I can always call her, we can meet so it's a good feeling and also within this practice”

2. Professional trainings

Opposite of mentorships, which are usually one-on-one relationships, trainings are mostly group activities. Companies nowadays provide a wide range of trainings for both new and senior employees. For our interviewees, introductory trainings were of particular importance. Those who participated in introductory trainings found it useful, while those who didn't have introductory trainings share an opinion that they were needed. Let's start with Berta's story:

*In the first week, my first day, they had the onboarding and there were a lot of sessions related to my job, to IT things, finance things and so on, and it's a global day. So all the new joiners at the company, we were I think 10 or 11 their new joiners we had a session together. Each session has one professional who taught the information about these fields. What we have to do and to know so all of the information. When I started this position, what I do now I had to travel to Ireland for a week and there we have the sessions and trainings. They had to teach me what I have to do in this position.
(Berta)*

As we can see, Berta spent a lot of time on training sessions during the first weeks of her job. She perceives session as “intense”, but still it was not enough for her to understand all what her role stands for. Because of that, she later on had Skype sessions with foreign colleagues and she could also always ask her boss for help. Still, she didn’t think she was learning enough until she started to work on specific tasks.

“When I was in Ireland, my colleagues showed me the systems and everything. What we have to know and do but it wasn't average enough for me because I'm a kind of person who likes to experience things and do it myself or on your own to do these things to get some experience. During this learning period, there are problems that I was experiencing. And after that I started to ask for help again, or to talk about again, that's how I have to do and what was there”.

On the other side, we have Berta’s story. She came to work in her temporary company as an intern and she was supposed to stay there only for six months. This is the reason why she didn’t go through an intensive training during the first weeks on her job. After she proved to be a good worker, she stayed in the company for longer, but now she thinks it was hard for her to adjust in the beginning because of lack of information.

“I didn't have the time to be trained for a month or something. So I was training like, one or two days. So it was very hectic. Most of most of the time, I was meeting with the managers with whom I was supposed to work with later on. Then I had a very short introduction, like, 'This is your team, this is how we are divided, and this is the organizational structure'. Very brief trainings, but just like one to one; me and the girl who was on the position before. When I look at it backwards, I would say that definitely, I would need a better training but involvement and better guidance from some senior who was missing there, I would say, because above me, there was just an HR manager and she was managing the whole recruitment and internal HR staff and it was too much because everything was just in the very beginning and had to be said and you're [inaudible] as it went”.

As we can conclude from the interviewee answers, although introductory trainings were not enough to learn about everything that is needed, they were still useful for employee integration in new company. They had an aim to provide the most basic information that will

be useful for a new employee in their future workdays. The interviewees also participated in other different professional trainings organized by the company where they work. Still, they don't tell if any of them had a particular effect on their learning process. On the opposite, sometimes they are perceived as too formal or bureaucratic, as we can see from Josh's and Berta's answers.

I have a schedule two or three different sessions that I had to participate. It's a good idea that the company has a SLA, in order to ensure that every the employee has training activity. The not good thing is that it's not done properly because, I give you an example, at least in my team, am the one which is more organized on activities, always done finishing my things on track, on deadline, breaks, everything is okay. However, I was obliged to a training, which is productivity. I did the session because it was in my calendar, and I did it, I finished. At the end, the trainer, he knew me because I was training him in the past. He told me, "Why are you here?" I told him, "Well, I was allocated here." He said, "Well, you know way more than me, so I don't know why you're here." This is what happened not only my case, I have seen many cases like that. This is what is missing. Not only here, my previous company was the same. We have a target of how many trainees every employee is supposed to have, but what was happening the managers in order to achieve their targets, they were sending their employees to random trainee just used to meet the targets, but not because it was relevant. So I had cases and those time, my previous company, I was a trainer as well. I had cases that I saw a guy four times already in the same training. I told him, "You should not come here. He said "Well, I don't have any other training more to go, but I need to go otherwise, you're not going to be my performance evaluation." (Josh)

"What I still find very weak in my company are these, let's say, continuous learning. So there are 15 trainings that you can take for Boolean search, for fundamentals of the Boolean search, and advanced Boolean search, or you can link in basics, and advanced, or we have their eternal database for basics and advanced level for the training. So there are like 15 trainings like that, but then there's nothing. So after one year, I was able to manage all the trainings, because sometimes it was difficult because they had one training per month, and it was organized from the US. So sometimes it would end at 2 am in the morning. That's why it took me a year to take all of them. And it started to repeat. So when the new records came, they were really exciting. I was like, 'This is a new training for me.' But there was nothing for me. So I have to say that this is something that I see as a place for improvement, like long

term trainings, and I'm sure they have it in America, but it wasn't in place in [inaudible] in the time (Berta)

3. Learning from peers

Colleagues have also shown to be an effective support in the process of learning new techniques and skills. They can provide help directly or indirectly. An employee can ask colleagues how to solve some problem or where to look for needed information, but they can also observe how their colleagues do their jobs in order to learn from the model. Colleagues are also important because in some situations an employee doesn't feel confident enough to seek answers from coworkers on higher positions.

"I worked in a team of seven, eight psychologists so some of them were really helpful and I think some of them were overloaded with work. So they didn't have that much time or interest to help me or to train me. But I think it wasn't personally just to be, how much they had to work because, of course, these are all I think, extra energy and time. But most of my colleagues they were really helpful in answering my questions and really thinking about the good answer. So I had a good experience with this (Zoila).

Sharing knowledge among peers is time-effective strategy in solving issues that are new or complicated. In Berta's opinion, it is helpful to share information among colleagues about different topics because it affects their works. Colleagues share information and opinions on formally organized meetings, but they also have an opportunity to ask for help while they are working in the office. Our interviewees say that it is a normal situation at their work place that can even be exhausting sometimes.

"So, we have an open office, so we are sitting together in one place and sometimes the other employees come to us and ask things. So, every second there is another question, another peer who is coming and asking something related to her or his work and privates things. It can be very disturbing in your work" (Berta).

Sharing knowledge among colleagues is not useful only for employees, but for overall success of the company. This is why managers initiate knowledge sharing sessions, which can be achieved by organizing real-time meetings or web-sessions. Employees also have an

opportunity to reach out a relevant person individually if they need assistance in conducting work that has already been done by someone else.

“Sometimes it took time, for example, for half a year, I wasn't able to get an approval for the [flyers] you have on job fairs, for those posters, and it took nearly half a year to get it approved. Usually, the structure was either I found a person by myself or easier way, I ask my boss and she was able to let me. But most of the time, I approach, for example, some recruiters abroad, “I saw that you use this type of poster. Who approved it to you? If you could guide me as well.” (Berta).

Learning from peers that are working in different environments has shown to be particularly important. Most of companies nowadays are international so they have different entities in other parts of the world. Different departments might have same roles and duties but their experience can be different since they are working in dealing with different cultures and laws.

“We have a lot of entities (branches) and they have HR professionals too, like somebody in Asian countries, somebody in Italy, somebody in UK, somebody in US and these people are all HR professionals. We sometimes share knowledge through this Skype calls mainly and via email” (Berta).

4. Trial and error

Finally, interviewees talk about the importance of learning by doing. While trainings, supervision and help from colleagues represent an important part of the learning process, they also find very important to accept the challenge and to learn things by experiencing it.

“The best thing is on-the-job learning. You come, and you immediately start to work on something, either on some project, or some job further that is coming, and you need to prepare materials, you need to organize the logistics of that, but also recruitment. So for example, we need to find the payroll manager and you need to learn, and so you're learning on the job observing the senior who is working on it” (Berta).

Appendix 2 . Interview consent form

Eötvös Loránd University
Faculty of Education and Psychology
Professional Learning Questionnaire

Dear Participant :

You have been identified as someone who can provide valuable information about professional learning. Our research project focuses on the improvement of professional learning, with particular interest in understanding the different dynamics between individuals, the workplace and its communities of practice. Our study does not aim to evaluate you. Rather, we are trying to learn more about professional learning and hopefully learn about workplaces practices that will help improve professional learning and development. Please, note three important rules of this study: (1) all your personal information will remain confidential and any type of recording will be destroyed after the transcripts are developed, (2) your participation in this study is absolutely voluntary and you may stop at any time if you feel uncomfortable, or simply don't want to answer a question (3) you have to sign this consent agreement in order to proceed with the interview (4) the scientist and other participants working and contributing to this study don't want to inflict any harm to any person.

General data

Name:

Nationality:

Age:

Country of Residence:

Gender: M ☐ F ☐

Civil Status:

Job position:

Studies:⁴

Years of working experience:

Years of experience on the field:

How many job position have you had in general:

How many job positions have you had on the field this interview is based on:

Interviewer:

Date of the interview:

Interviewee Agreement Signature

⁴ Please write your tertiary level degrees BA, MA, PhD, etc.

Appendix 3. Interview guideline

1. Circumstances that promote or inhibit professional learning in the workplace.

- 1.1 Looking back at your first weeks at your job, how did you get the necessary information to get oriented (i.e. learn what's expected from you, how to behave in the workplace, to whom address concerns, etc.)
- 1.2 What type of support did you get in order to start working? (performing activities)

2. Role of the communities of practice on individual professional learning

- 2.1 How long did it take you to participate in knowledge sharing activities with your colleagues? (knowledge and skills)
- 2.2 Could you describe the circumstances in which you needed the help of your colleagues?
 - 2.2.1 Could you describe a particular situation?
 - 2.2.2 What worked? (Why)
 - 2.2.3 What didn't work? (Why)
- 2.3 In what circumstances did you feel welcomed when you ask for help?
- 2.4 Under what circumstances did you feel that people don't want to share knowledge with you?

3. Role of the workplace in the relationship between the individual and the Community of Practice.

- 3.1 Do you have time scheduled for knowledge sharing at your job?

3.2 Is your workplace organized in a way that facilitates knowledge sharing?

3.3 Does the workplace provide learning opportunities? (internal courses, learning travels, etc.)

3.3.1 Does your participation in these learning opportunities support your individual work/work with your team)?

4. Role of the individual professional learning in the communities of practice

4.1 What did you provide to the team?

4.2 How did you support other members of your team work after your integration period?

4.3 What ideas did you proposed to the team that were later used?

4.4 What would you change in the workplace to make the integration process more efficient?

4.5 What would you do differently if you went through the same process again?



EÖTVÖS LORÁND TUDOMÁNYEGYETEM

Declaration form for disclosure of a doctoral thesis

The data of the doctoral thesis:

Name of the author: Deisi Yunga

MTMT-identifier: **10057439**.

Title and subtitle of the doctoral thesis: Educating the reflective professional in teacher education: Professional learning in teaching and in other professions

I. DOI-identifier⁵:10.15476/ELTE.2018.234

Name of the doctoral school: Doctoral School of Education

Name of the doctoral programme: EDiTE

Name and scientific degree of the supervisor: Orsolya Kereszty, associate professor

Workplace of the supervisor: ELTE PPK

II. Declarations

1. As the author of the doctoral thesis,⁶

a) I agree to public disclosure of my doctoral thesis after obtaining a doctoral degree in the storage of ELTE Digital Institutional Repository. I authorize Dániel Kulcsár, the administrator of the Students Registrar Office of the Doctoral School to upload the thesis and the abstract to ELTE Digital Institutional Repository, and I authorize the administrator to fill all the declarations that are required in this procedure.

⁵ Filled by the administrator of the faculty offices.

⁶ The relevant part shall be underlined.

b) I request to defer public disclosure to the University Library and the ELTE Digital Institutional Repository until the date of announcement of the patent or protection. For details, see the attached application form;⁷

c) I request in case the doctoral thesis contains qualified data pertaining to national security, to disclose the doctoral thesis publicly to the University Library and the ELTE Digital Institutional Repository ensuing the lapse of the period of the qualification process.;⁸

d) I request to defer public disclosure to the University Library and the ELTE Digital Institutional Repository, in case there is a publishing contract concluded during the doctoral procedure or up until the award of the degree. However, the bibliographical data of the work shall be accessible to the public. If the publication of the doctoral thesis will not be carried out within a year from the award of the degree subject to the publishing contract, I agree to the public disclosure of the doctoral thesis and abstract to the University Library and the ELTE Digital Institutional Repository.⁹

2. As the author of the doctoral thesis, I declare that

a) the doctoral thesis and abstract uploaded to the ELTE Digital Institutional Repository are entirely the result of my own intellectual work and as far as I know, I did not infringe anyone's intellectual property rights.;

b) the printed version of the doctoral thesis and the abstract are identical with the doctoral thesis files (texts and diagrams) submitted on electronic device.

3. As the author of the doctoral thesis, I agree to the inspection of the thesis and the abstract by uploading them to a plagiarism checker software.

Budapest, 2019

Signature of thesis author

⁷ Submitting the doctoral thesis to the Disciplinary Doctoral Council, the patent or protection application form and the request for deferment of public disclosure shall also be attached.

⁸ Submitting the doctoral thesis, the notarial deed pertaining to the qualified data shall also be attached.

⁹ Submitting the doctoral thesis, the publishing contract shall also be attached.